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The Responsibility for Following up Venereal Disease Contacts*

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IN answering the question "Whose is the responsibility for the following up of the venereal disease contact?" it would be presumptuous on my part to attempt to place all the responsibility on the medical officer of health. It is certainly the responsibility of the Department, and it is also the responsibility of every practising physician in Ontario who is treating venereal disease. You know better than I the great difficulty in following up venereal disease contacts. In some States where an effort is really successful, it is the responsibility of an epidemiologist who has a trained staff. I believe that, on the whole, the medical officers of health of this province are handling a difficult and delicate piece of work very satisfactorily.

I realize that we need a campaign of education, directed not only to the public, but to physicians, to impress upon them the importance of contacts, because every case of venereal disease comes from another case, and it is very important to find out this other case. This is a very difficult piece of work, and it is a great problem. You all know how it is done with the clinic patient, but with the private patient under a private physician, it is a very delicate situation. It requires a great deal more time than the physician can devote to it. For instance, a doctor practising in Toronto had a patient with early syphilis who received the five-day drip treatment. This man said there were only two possible contacts, both women. The physician did his best to impress upon the patient the seriousness of allowing either one of these contacts to be at large without treatment. He did not know whether or not they were able to pay for private treatment, but he told the patient that if he would bring the women to

**Presented at the twenty-seventh annual conference of the Ontario Health Officers Association, held in Toronto May 22 and 23, 1941.*

his office, he would examine them and treat them free of charge. He did not succeed in getting either of them to come to the office. As far as the doctor was concerned, the effort was an absolute failure. If any one in this audience has an idea as to how these contacts could have been brought under treatment, I would be glad to have the answer.

On one occasion, a man suffering from early syphilis gave the names of six contacts, from Nova Scotia to British Columbia. It certainly was a delicate situation to contact these women. Some of them were married. However, examinations were carried out, and I am glad to say that five were negative, and only one had a positive Wassermann test. These situations are very difficult for the private physician. As you know, the law says that if you say that another person has venereal disease, you are liable to be imprisoned.

Our great trouble at present is not only following up the contact, but following up the patient until non-infectious. This we are attempting to do in various ways. If we succeed (I am talking now of syphilis, as that is the disease we are most concerned with) in quickly rendering the patient non-infectious by intensive treatment, the contact problem will be negligible.

The Department of Health of Ontario has been instrumental in introducing the five-day drip or six-day intensive Mapharsen therapy for early syphillis. Most of the clinics have already adopted it, and the clinics which have done so are following it with periodical examinations. As you know, the experimental trial of this treatment was done in New York City at Mount Sinai Hospital. It was used on five hundred patients with early syphilis. The experiment has been followed from two to seven years, and some hundreds of cases for five years. The cures were as good as those obtained with the old method of requiring three courses of treatment. I would like to read you a letter from Dr. George Baehr, a leading internist in New York City. You can see that these 500 early cases transmitted practically no syphilis, and there were, therefore, no contacts.

"1. The first series of twenty-five patients were treated in 1933 with neoarsphenamine in accordance with the five-day technique with which you are familiar, without any fatalities and without any serious morbidity. Nineteen of these patients were still under observation after three years and we have been able to follow fifteen for more than five years. All have apparently been cured, except one case, which developed a new infection or a possible relapse. The others have never shown any clinical manifestations of syphilis, and the Wassermann test has been negative both in the blood and spinal fluid.

"2. During the past two years, the work has been carried on under the supervision of a committee consisting of a representative of the United States Public Health Service, the New York City Department of Health, the American Social Hygiene Association, the head of the Departments of Internal Medicine at the New York, Presbyterian and Mount Sinai Hospitals. From February, 1938, until September, 1938, 86 cases were treated with neoarsphenamine. One died of hemorrhagic encephalitis. Of the remaining cases of this series which have been followed since the five-day treatment, 90 per cent are apparently cured.

Their blood and spinal fluid Wassermann are negative, and they present no clinical manifestations of syphilis. An additional 5 per cent are in the doubtful class—their Wassermann not yet having become completely negative. The remaining 5 per cent are definite failures, either serologically or clinically, and have required treatment.

"3. Since October, 1938, 250 additional patients have been treated by the same five-day technique with arsenoxide (Mapharsen). There have been no fatalities and no serious morbidity. It already appears that at least 85 per cent have been cured both serologically and clinically. In an additional 5 per cent of recently treated cases, the Wassermann has not yet had time to reach complete negativity. Eighteen cases have either had a clinical or serological relapse or have been Wassermann-fast. They have been re-treated by the same five-day method of intensive intravenous drip without difficulty, and most of them have already become negative since the second course of treatment.

"Our own total experience with this technique comprises 279 courses of intensive therapy on 361 patients with early syphilis, all cases being seen within six months after developing their primary infection. The toxic manifestations which were evident in the first series of 111 cases treated with neoarsphenamine and which were analgous to those observed in the ordinary method of treatment with this preparation, have been almost completely eliminated in the Mapharsen series. In fact, the toxic phenomena in the 250 patients treated in the Mapharsen series have been negligible, and there has been no fatality.

"Having observed this work from the outside, it is my opinion as a clinician that we can expect at least 85 per cent of all early cases to be cured by this five-day treatment during which period they receive a total dose of 1.2 grams of Mapharsen. The remaining 10 to 15 per cent may require a second course after a period of three months. The toxic manifestations will not be more than that which ordinarily follows the intravenous injections of those arsenical preparations."

Now, let us dwell on this for a moment, and let me read you another excerpt of a paper published last year by a doctor of twenty years' experience in our largest clinic. He states:

"The high percentage of lost cases, an average of 43 per cent, was a great disappointment to us. These were listed as lost only after every means at our disposal was exhausted in trying to trace these patients and persuade them or even force them to complete their treatment. In this group will be found in years to come a very high percentage of cardiovascular and neurosyphilis."

You can see, and this may be disputed, that the loss from this clinic was so great that only every other man was treated. Half of these losses were early infectious cases. Now, think of the contact problem presented by all these patients who were lost to treatment. It would appear that the drip treatment has proved itself efficient in preventing contacts, because if 85 per cent of them have remained cured for five years, it would certainly seem that the 85 per cent were non-infectious and therefore would not transmit syphilis. The Detroit

clinic has adopted this method with some modification, and a number of the clinics in Ontario are also adopting it.

Now, as to the prostitute. We believe that if she is known to have syphilis, she should be quarantined until she is non-infectious. This is done in British Columbia and Quebec, where they are held for three months. We have gone a step further. We hold them not only until they are non-infectious but until they have received adequate treatment To allow early infectious cases to attend a clinic and work at their trade because they have no other means of livelihood, seems to be foolish.

To get back to the matter of education of both the public and the physicians, we intend in the near future to put on an intensive campaign to make the public venereal-disease conscious. We may get some criticism, but we are going to try. Our leadership for this, I must confess with a bit of pride, originated in Canada, namely, in British Columbia. The Greater Vancouver Health League just recently sent out twenty-five hundred questionnaires to prominent people in all walks of life. Among other questions, they were asked if they approved of instruction concerning venereal diseases in high schools. They received twenty-three hundred answers in the affirmative. This is a slight indication of what can be done in educating the public. They have been doing it for three years now, by way of posters, articles in the press, etc. They are really advanced in their educational methods. The Director of the Division of Venereal Disease Control in the Provincial Board of Health showed me letters from Ontario institutions asking for literature on venereal diseases. This shows that we are definitely lagging behind public interest. We are certainly not giving leadership. I really believe that the crux of the contact follow-up lies in educational work, and until we educate everyone, we are not going to be very successful.

I should like to tell you of the difficulties in this contact problem in our north country. Two or three men come to a clinic, suffering from gonorrhoea, and they name a certain prostitute as the source of their infection. The medical officer of health has the police detain this person. She denies having venereal disease, and says she will produce a medical certificate, which is easy to get in those northern towns. She goes to a certain doctor whom they all know. He takes a smear. The gonococcus is not present in the smear. Therefore, he gives her a certificate that she is free from gonorrhoea. This is an utter fallacy. Not 10 per cent of these chronic cases can be detected by smears. They all are smart enough to know that if they take a little medication of the sulphonamide group and a douche before they go to the doctor, it is impossible to get a positive smear. It is so difficult to detect the chronic cases that in certain clinics, provocative tests are done before smears and cultures are taken at all. The clinic knows it is useless to attempt to find the gonococcus until this is done. Therefore, this woman has no trouble taking a certificate before a magistrate which states that the doctor did not find venereal disease and that the test was negative. The magistrate is unable to hold her if she is non-infectious. An attempt to hold her on a charge of vagrancy brings into court, especially in

the north country, a pimp taxi-cab driver, who swears that the woman is not a vagrant but is living with him. The magistrate releases her, and needless to say she is rushed out of town and across the border into Quebec or she is driven two or three hundred miles away to begin over again in another mining camp. This situation must be corrected. Just how to do it is a problem on which we are now working. One smear as a negative test for gonorrhoea is absolutely useless, and only serves to evade the law. I would like some ideas from this body of representative physicians as to how to prevent these worthless certificates.

You all know that the old laws and regulations required the person to be treated until non-infective. We have changed that now so that the person is compelled by law to take treatment until such treatment is deemed adequate to prevent the sequelae of infection, such as cardiovascular disease, insanity, paralysis and blindness. We have changed the law so that the person is compelled to take treatment until the treatment is deemed adequate to prevent him becoming a pensioner of the State because of neurosyphilis. The cost to the State at present for cardiovascular disease, paresis, tabes, and blindness is conservatively estimated at a million dollars a year, to say nothing of the human misery involved. In British Columbia, where neurosyphilis was not treated until three or four years ago, there are now three tabetics for each paretic, since the mortality among the paretics is high. We do not know what the situation is in Ontario, but we do know that it costs upwards of half a million dollars a year to institutionalize the paretics alone.

The Ontario Government has come to the point now that they have made it a crime for patients not to take treatment. Every positive blood test made in the Branch Laboratories throughout the province is reported to the Central Laboratory. The physician is compelled by law to report a case of syphilis when it first comes under his observation for treatment. He is compelled by law to report any patient who discontinues treatment without permission, that is, when the patient fails to report to the doctor for two consecutive weeks. If the physician cannot induce him to resume treatment or cannot follow him, the Department will attempt to do so, and will bring the man back to his own physician for treatment, if at all possible; if not, he is sent to a public clinic; and, failing that, to jail.

To you show you how difficult it is to get people to have their blood tested, I would like to give you an instance of what occurred at Burwash Jail last year. The normal number of syphilitics in previous years was approximately eighty. They were treated by the old method—weekly injections in hip and arm. Most of them had been under treatment in different clinics for years and very few of them obtained negative blood tests. If a few of them did obtain negative tests, new arrivals kept the average at about eighty. Last year we attempted the five-day drip technique. We divided them into two classes. One class received the drip treatment for five days and the other class received the same treatment plus fifty hours of fever therapy. The result was that in eight months 75 per cent of them had a negative blood test; i.e., we had reduced the

average number of cases under treatment by 75 per cent. We wished to follow these cases, and offered them $2.00 each time they sent a sample of their blood for examination. To date, six months after the New Year, we have received only about three. I am glad to say that they were still negative. These people cannot be followed; of that I am quite sure. We cannot enforce treatment after they leave the jail, any more than we could enforce prohibition. I think the method of choice is to give them the five-day drip treatment when they come in, and the five-day treatment before they go out, and bid them a fond farewell. I don't think they can be followed up.

THIRTY-FIRST ANNUAL MEETING
CANADIAN PUBLIC HEALTH ASSOCIATION

TWENTY-EIGHTH ANNUAL CONFERENCE
ONTARIO HEALTH OFFICERS ASSOCIATION

ROYAL YORK HOTEL, TORONTO

JUNE 1-3, 1942

The Development of County Health Units in the Province of Quebec*

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IN Canada public health has taken the important place it should occupy in all civilized countries. Legislators, public men, and the press, which acts as their interpreter, are constantly providing means to improve the health of the people. They are continually pointing out the necessity of protecting the population against disease and the advantages to be gained thereby. The system of health administration in operation in our large centres is recognized as the most effective means of providing health services. The problem of providing such services for a rural population as extensive as that of the Province of Quebec is altogether different and much more difficult to solve.

In 1925, the late Dr. Alphonse Lessard, who was then Director of the Provincial Bureau of Health, gratefully accepted the co-operation offered by the International Health Division of the Rockefeller Foundation. We feel that it is our duty to pay public tribute to the Rockefeller Foundation for its generosity to Quebec, and to Dr. F. F. Russell, Dr. John A. Ferrell, and Dr. William McIntosh, who were always ready to answer our appeals for advice, and other important requests, with generous understanding. Dr. Lessard studied at first hand the sanitary organization of various States of the American Union, particularly those of North Carolina and Ohio, and was able to see for himself the good results obtained. The experience in England as well as in the United States has shown that, beyond doubt, one of the best means of protecting the health of rural and semi-urban populations is the provision of local health bureaux. The county health unit places at the disposal of the public the services of a staff composed of a physician, nurses, and health inspectors, who devote all their time to this work. Experience has proved that this type of health organization is the only effective one and the one which brings about the quickest results. The people of our Province soon recognized the value of full-time health services and it is to their credit that they willingly accepted these local bureaux, with the obligations which they entailed. The budgets for the county health units range from ten to fifteen thousand dollars a year. The greater part of this amount is paid by the Ministry of Health and the remainder by the county council and independent municipalities, on a basis of one and a half cents per hundred dollars of evaluation, or two cents when the population of the independent municipality is over 4,000.

*Presented at the thirtieth annual meeting of the Canadian Public Health Association held in the City of Quebec June 9-11, 1941.

THE ORGANIZATION OF COUNTY HEALTH UNITS IN QUEBEC

Since the formation of the first unit in 1926, the expansion of county health units in the Province of Quebec has been rapid. The population of the province at that time was 2,561,800. The larger cities—Montreal with a population of 685,000, Lachine (17,000), Outremont (22,500), Verdun (40,000), and Westmount (30,000)—were provided with adequate public health services through organized health departments, but the rural communities were without such services. In 1926 the first health unit was established in Beauce, a county whose population then numbered 43,894 inhabitants, representing 1.7 per cent of the total population. At that time, 30.6 per cent of the population of the province enjoyed the advantages of organized health services.

In the following year three health units were founded: St. Jean-Iberville, Lac St. Jean-Roberval, and St. Hyacinthe-Rouville. The territory served by these units had a population of 105,827, or 4.1 per cent of the population of the province, which now numbered 2,604,000. The proportion of districts which possessed a sanitary organization, health unit, or urban health service, increased to 32.5.

In 1928, with the establishment of health units in the Counties of Temiscouata—Rivière-du-Loup, Nicolet, and Joliette, the population of which numbered 107,245, the percentage of organized regions rose to 36.6. The population of the province then numbered 2,647,000.

In 1929, six health units were established in the Counties of Terrebonne, L'Assomption-Montcalm, Chicoutimi, Témiscamingue, Mégantic, and Kamouraska-L'Islet. This brought the percentage of people enjoying the advantages offered by county health units to 8.2, and that of organized districts to 40.9. The total population was then 2,690,400.

Nineteen hundred and thirty was a record year, notable for the inauguration of nine health units, those of Lotbinière, Matane, Lévis, Matapédia, Rimouski, Châteauguay-Laprairie-Napierville, Argenteuil, Bonaventure, and Labelle. The population of these counties totalled 241,562, comprising 9.8 per cent of the population of the province. Almost half (49.1 per cent) the population of the province was then provided with organized health services by the end of the year.

With the organization of the Counties of Gaspé-East, Papineau, and Gaspé-West in 1931, health services were provided for territory inhabited by 66,608 people—2.3 per cent of the population of the province. In Quebec at that time 58.9 per cent of the population of 2,874,255 were enjoying the privileges of public health services.

In 1932 the Counties of Champlain, St. Maurice, and Laviolette were organized and their population, numbering 94,870, provided with health services. This increase of 3.2 per cent brought to 61.2 the total percentage of the population (2,925,615) so served.

Only one health unit was established in 1933, that serving the Magdalen Islands, with a population of 8,481. This unit provides social and medical aid

in combination with a large hospital, and renders invaluable service to a population isolated from large centres.

The Counties of Abitibi and Huntingdon, whose combined population number 46,096, that is, 1.5 per cent of the total population of the Province, organized health units in 1934.

The year 1935 was one of economic depression and no new health units were opened. The population of the Province was then 3,025,000 and 64.8 per cent had organized health services.

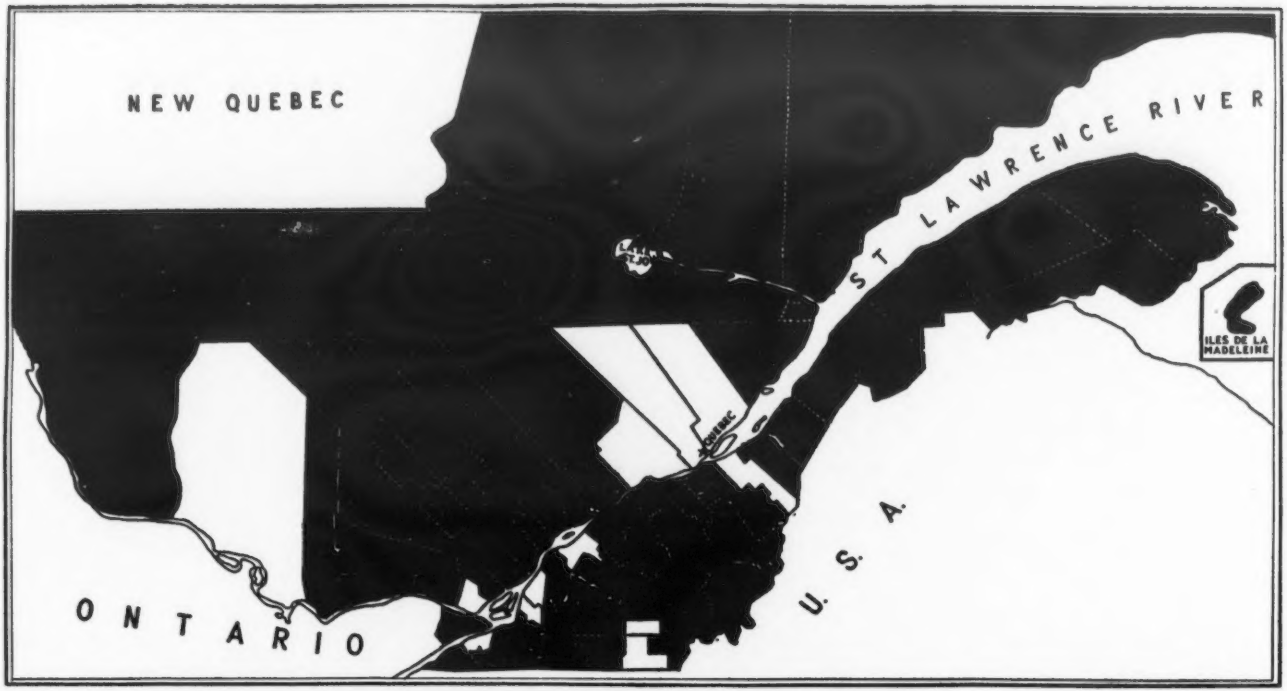
Maskinongé was the only county to organize a health unit in 1936. In the following year the Counties of Arthabaska and Brome-Missisquoi, with 1.9 per cent of the population of the province, followed its example.

Nineteen hundred and thirty-eight was marked by the opening of the first urban health unit, organized in Trois Rivières after a careful study of hygienic conditions, made by the Provincial Bureau of Health. In addition, the City of Laviolette and the Counties of Shefford, Compton, Drummond, Frontenac, and Wolfe were organized. The population of the province was then 3,185,000.

An event of even more importance indicated that the expansion of the public health movement was on its way to cover the whole province. The City of Quebec, though the second largest city in the province from the standpoint of population, had not seen fit to appoint a physician with special training in public health to direct its health bureau. In 1938 a graduate in public health was appointed to this office and he began to organize the municipal department on a scientific basis and to extend its activities to include all branches of public health. Thus in 1938 the advantages provided by the health units were made available to 308,380 more people, an increase of 9.7 per cent of the total population.

In 1939 the Counties of Richmond, Dorchester, and Hull organized their health services. In 1940, Richelieu, Charlevoix-Saguenay and Berthier followed suit. Finally, in 1941, health units were established for Gatineau, Bagot, Valleyfield, and Beauharnois City. The population of the province in these three years was 3,230,000, 3,270,500, and 3,310,000, respectively. Today, 84.7 per cent of the population enjoy the advantages of full-time health services. The total population of the counties provided with health units is 1,575,668, which represents 47.6 per cent of the population of the province. At the present time there are forty-seven units serving fifty-seven municipal counties.

Since 1926 a vast amount of work has been carried on continuously by the health units. From 1926 to 1940 the general mortality rate decreased from 14.2 to 10.1 per 1,000 population; infant mortality from 142.0 to 70.3 per 1,000 living births; the tuberculosis mortality rate from 125.2 to 76.2 per 100,000; diphtheria from 14.0 to 7.1; and typhoid fever from 9.0 to 4.0. It is recognised that the decrease in these rates was not due entirely to our health units; urban health bureaux did their share, and economic conditions and the education of the public were also contributing factors. At present the personnel of the units includes sixty-five physicians who have had special



EXTENT OF THE DEVELOPMENT OF FULL-TIME COUNTY HEALTH UNITS IN QUEBEC

The areas in black represent 61 counties served by 49 full-time health units (December 1941), providing services for 49.7 per cent of the population of the province. Included in these counties are 35 cities and towns of over 5,000, with a population of 388,209, constituting 23.6 per cent of the population served by the units.

training in public health, fifteen physicians who have specialized in tuberculosis, one hundred and fifteen visiting nurses, fifty health inspectors, ten of whom are veterinary surgeons, and the secretaries of the health units. In addition, there are twelve physicians directing the staff of three hundred and thirty-five people whose efforts are all directed towards the improvement of public health in the Province of Quebec.

ORGANIZATION OF HEALTH UNITS IN THE PROVINCE OF QUEBEC

Year	Population of the province	Percentage organized	Units organized	Population	Percentage of the total population
			CITIES ORGANIZED BEFORE 1926		
1926	2,061,800	30.6	Montréal Lachine Outremont Verdun Westmount	784,500	30.6
			CITIES AND COUNTIES ORGANIZED SINCE 1926		
1926	2,561,800	30.6	Beauce	43,894	1.7
1927	2,604,000	32.5	St-Jean-Iberville Lac-St-Jean-Roberval St-Hyacinthe-Rouville	105,827	4.1
1928	2,647,000	36.6	Témiscouata-Rivière-du-Loup Nicolet Joliette	107,245	4.1
1929	2,690,400	40.9	Terrebonne L'Assomption-Montcalm Chicoutimi Témiscamingue Mégantic Kamouraska-L'Islet	221,409	8.2
1930	2,735,000	49.1	Lotbinière Matane Lévis Matapédia Rimouski Châteauguay-Lapierre-Napierville Argenteuil Bonaventure Labelle	241,562	9.8
1931	2,874,255	58.9	Gaspé-Est Papineau Gaspé-Ouest	66,608	2.3
1932	2,925,615	61.2	Champlain St-Maurice Laviolette	94,870	3.2
1933	2,974,000	64.6	Iles-de-la Madeleine	8,481	0.2
1934	3,025,000	46.8	Abitibi Huntingdon	46,096	1.5
1935	3,073,000	66.5			

Year	Population of the province	Percentage organized	Units organized	Population	Percentage of the total population
1936	3,110,000	66.6	Maskinongé	17,225	0.6
1937	3,140,000	67.2	Arthabaska Brome-Missisquoi	60,821	1.9
1938	3,185,000	69.0	Shefford Trois-Rivières Compton Drummond Frontenac Wolfe Québec	308,380	9.7
1939	3,230,000	78.5	Richmond Dorchester Hull	95,450	3.0
1940	3,270,500	81.5	Richelieu Charlevoix-Saguenay Berthier	93,070	2.8
1941	3,310,000	84.7	Gatineau Bagot Valleyfield Beauharnois	64,730	2.0

The Relationship of the Medical Officer of Health to the Local Board of Health*

J. HOWARD MUNRO, M.D.
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THE relationship of the medical officer of health to the local board of health might be considered by many to be fully covered in that part of the Revised Statutes of Ontario 1937, Chapter 299, Section 37, where it is stated: "The medical officer of health shall be the executive officer of the local board." That is quite true; but note that it goes on to say: "and, with the local board, shall be responsible for the carrying out of the provisions of this Act, and of the Regulations, and of the public health or sanitary by-laws of the municipality." The latter clause enlarges the scope of his duties very materially, and makes him equally responsible with the local board for all public health and sanitary work, whether outlined by the Public Health Act or by the municipality.

Now to whom are you, as medical officers of health, responsible in the performance of your duties?

When you consider that the Department of Health is interested in your appointment, by ratification of it, and also interested in the tenure of your office by insuring that you shall not wrongfully be discharged, I think you will agree that one of your responsibilities is very definitely to the Department in carrying out your duties according to governmental regulations.

What about your duty towards the local board of health? Who constitutes the local board of health? Again the Statutes define that: the head of the municipality (a person elected by the people), a person appointed by the local Council, and lastly the medical officer of health.

There you find the relationship of the health officer of a dual nature. You deal with the local board of health as an organized body and with the individuals in that body, but you also find that one is an elected representative of the public and the other an appointed representative (indirectly) of the public. So that your second and greatest responsibility is with the board of health as typifying the public. Thus your responsibilities which began by being the statutory "executive officer of the local board of health" have expanded to great responsibilities to the Department of Health, the organized local board of health, and the public which this latter represents.

The fact that a gathering and conference of medical officers of health, such as that of these two days, can take place in Ontario this year is ample proof that the medical officers of health do not take a light or superficial view of their responsibilities to the Government or to the public. And the most

**Presented at the twenty-seventh annual conference of the Ontario Health Officers Association, held in Toronto May 22 and 23, 1941.*

amazing aspect to me—and I do not say this lightly, but rather after looking up considerable data on the subject—is that you are the most poorly-paid group of professional servants of the public in the Province. That loyalty to service, so typical of our medical profession, placing service to the public above financial remuneration, is nowhere more evident than in the body of medical officers of health, particularly those of smaller municipalities.

Your duties are becoming more and more specialized, demand more time and study, and have long passed the day when the medical officer of a small municipality was a doctor who was appointed to quarantine and remove quarantine from homes where scarlet fever, smallpox, or diphtheria existed, see that wells were not too badly contaminated and pay occasional visits to schools from a sanitary point of view. Now I do not belittle the work of the older medical officers, of whom I was one some thirty-odd years ago, for we laid the ground-work for the elaborate system that has since been built up. But I feel that while your duties and responsibilities have greatly expanded and multiplied four-fold, that fact has not been appreciated to the same extent by the municipal councils under the present system of small local boards of health.

The part you now play in your relationship to your local board of health, and through them to the public, is that of a soldier in the front ranks in the never-ending campaign against disease in its preventable forms, a foe who recognizes no municipal boundaries and who speedily finds every weakness in the wall of defence. You must have more than a superficial knowledge of sanitation, be capable of dealing most effectively with epidemics, know how to carry out regulations concerning foods, and other highly specialized duties. To your local board of health, in many of these matters which are of a medical nature, you must be guide, counsellor and friend, and for the others you must enlist their full co-operation.

Of all these measures mentioned, I feel that one of the most important is that dealing with the prevention of disease. Here we meet our old enemy tuberculosis, and we also deal with the youth of school-age and pre-school age, in the endeavour to produce a healthy vigorous generation of young Canadians who may be able more capably to take over the conduct of affairs from our more feeble hands. This service I know you are now performing, often under difficulties, and for little remuneration save in the knowledge of work well done. But I feel that medical officers are asked to do their work with few tools, and that money spent in preventive health measures (which do not show any spectacular immediate results) is too often grudgingly given by municipal laymen. For that reason I have been converted to the idea that a change from a multiplicity of small boards of health to that of a county board of health would prove more effective as well as more economical, and add a much greater striking power to your offensive as medical health officers in your work.

If you will bear with me in concluding this rather rambling talk, I would like to tell you of such an organization, which, I think, is the only one of its kind in the Province of Ontario, and of which I have the honour of being chairman. I leave it with you as something you might consider when you

are performing your duties as medical officers and seeking the most effective manner of fighting communicable diseases.

I am going to outline a plan we undertook in our counties to establish a framework of health services that we hope will be immediately beneficial and economical and, at the same time, elastic enough to care for added health services as they become feasible, and I will leave with you the question whether educational work might not be done in your own county along similar lines.

The three united Counties of Stormont, Dundas, and Glengarry cover a territory of approximately 1,200 square miles, with a population of 71,500. There are 12 townships, 2 towns (one of them having a population, with suburbs, of 20,000), and 7 incorporated villages—a total of 21 municipalities. This we may take, I believe, as an average cross-section of Ontario, from the taxpayer's point of view.

In the Counties' Council in 1939, some of us, feeling that the method of management of health problems by local boards of health was not as efficient as was desirable, began the movement for the establishment of a county health unit to take over all functions of the local boards of health and the administration of public health within our counties. With the assistance of officials of the Department of Health a set of rules and regulations was drafted and a tentative outline of the composition of such a county organization was prepared and submitted to the Counties' Council in January, 1940. This was adopted by a small majority at that time, and, I may say, ratified again in January, 1941, and the County Board of Health began to function on April 1, 1940. This Board consists of five members, the counties' warden, two county councillors, the medical director, and one appointee of the Department of Health of Ontario. We engaged a medical director, a nursing supervisor, eight trained nurses, all holding public health qualifications, three sanitary inspectors, fully qualified, and four medical officers of health (part-time), which number we expect to increase to six immediately.

We now feel that, with this set-up, we not only can carry on more efficiently and more economically the public health work previously administered locally by the municipalities but we can add considerably to these services. The sanitary inspectors are responsible for food inspection and other work that previously had been done in a haphazard way in many parts. All the summer cottages and camps along the St. Lawrence, within our boundaries, are regularly and thoroughly inspected and brought up to higher standards. Our nurses, in addition to school duties, have taken up pre-natal supervision, visits to homes and follow-up of pre-school age children, supervision of homes (in collaboration with the Children's Aid Society), entertaining our young British war guests, and doing a great deal of work in connection with our great problem of tuberculosis. The Sanatorium, an institution of 112 beds owned and operated by our counties, does extensive work all over the counties through the provision of free mobile clinics, complete with X-ray. Our public health nurses do special work in this field. Co-operating with the Sanatorium staff, they make all arrangements for attendance of the public at the clinics (through the private physicians), take charge of the supervision

of contacts and convalescents, and have general supervision of them without in any way disturbing the relationship existing between the family and the private physician.

Thus you see we try to supervise the child from a public health standpoint, from birth, through pre-school age, during school age, and subsequently as occasion demands. Well-baby clinics, mental clinics, regular school medical inspection, vaccination and diphtheria immunization are also provided.

I would earnestly commend the examination of such a scheme by county councils, as I feel that such a structure will not only carry the load of existing public health as administered locally, but is capable of adding many health services now beyond the means of smaller municipalities.

But education of the public to this sort of change is necessary and nowhere can we find greater help than may be given by the medical officers of health. I know that of all men, you are most interested in the health of the community, that you realize that preventive measures are most effective when instituted during youthful years. And I leave with you the thought that we are all seeking the best way to develop the very best in our youth and prevent them from too soon facing life's sunset.

Chemical and Toxicological Studies on Phenothiazine

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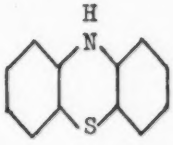
IN a recent paper, E. Kuitunen-Ekbaum (1) described the activity of phenothiazine in the treatment of pinworm infestation. Her experiments are a first attempt to use this drug, so far widely employed as an anthelmintic in veterinary medicine, on a larger scale in the treatment of worm infestations in humans. Good results were obtained in a group of 89 children and 9 adults, and with moderate dosage of the drug (5-10 grams per treatment) no unfavourable reactions occurred.

While these clinical trials were proceeding, a report by Manson-Bahr (2) on the successful use of phenothiazine in 9 cases of pinworm infestation was published. This author used a considerably higher dosage (7-40 grams) apparently without toxic effects. De Eds and co-workers (3), who used phenothiazine in the treatment of infections of the urinary tract, reported the development of anaemia in 3 out of 49 cases. This condition was found only after the administration of large doses of the drug and showed a good tendency toward complete reparation.*

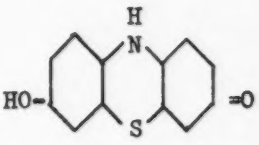
In this paper, the laboratory studies are presented that were carried out in connection with the clinical trial of the drug conducted by Kuitunen-Ekbaum. These include the purification of phenothiazine and certain toxicological investigations.

PURIFICATION OF PHENOTHIAZINE

Phenothiazine (formula I), first described by Bernthsen in 1885, is an intermediate of a red thiazine dye-stuff thionol (formula II), closely related to



I
Phenothiazine



II
Thionol

FORMULAE I AND II

**In a recent paper D. Hubble (Lancet, 1941² : 601) reports on twenty cases of threadworm infection, successfully treated with phenothiazine. There were however three cases of anaemia, two of them complicated by jaundice. The doses given in these cases were generally higher than those recommended by Kuitunen-Ekbaum, but in one case jaundice and anaemia occurred in an infant of two and a half years after only 2 grams of the drug. No explanation for these ill effects is given. All children recovered.*

methylene blue. It is a faintly yellow powder completely insoluble in water, but soluble in organic solvents. Owing to its properties as a dye-stuff intermediate, phenothiazine is fairly sensitive to oxidation by light and air. Phenothiazine when oxidized becomes greenish in colour and in higher stages of oxidation a purplish-gray tinge is evident. In the literature, purification by recrystallization from benzene or toluene is recommended. These solvents were employed with good results. Decolourization in a hot solution was effected by the use of charcoal and an almost colourless filtrate was obtained from which crystals were obtained on chilling in the form of large glittering scales. After washing and drying, the crystals were ground to a fine powder which had a melting point of 180°C. For the preparation of larger quantities, it was found that this method of recrystallization was not entirely satisfactory. The large crystals were extremely sensitive to oxidation during the processing, and the different batches of the purified drug were not always uniform in colour. Another more simple and cheap way for obtaining a pure and uniform product was developed. The method consists in precipitating phenothiazine in the presence of a stabilizing reducing agent.

A 20 per cent solution of commercial phenothiazine was prepared in cold acetone. The purplish-red solution was treated with charcoal and allowed to stand for about thirty minutes. It was then filtered directly into twice its volume of water, containing 1 per cent sodium formaldehyde sulfoxylate. A faintly yellow microcrystalline precipitate separated immediately and was allowed to settle in the refrigerator. It was collected on a Buchner funnel, thoroughly washed with water, and dried in a vacuum oven at 60°C. Complete drying is essential for the stability of the product. The dried material possesses all the chemical and physical properties of a pure phenothiazine. Since it is obtained as a fine voluminous powder, further handling or grinding is not necessary. The presence of the reducing agent during the preparation prevents almost completely undesired oxidation. Most of the following experiments were carried out with material purified by this method.

TOLERANCE TO PHENOTHIAZINE

Phenothiazine is considered a drug of very low toxicity. It has been extensively used as a potent anthelmintic in domestic animals, and much data have been collected concerning its toxicity and tolerance. In table I data are presented concerning tolerance to phenothiazine compiled chiefly from recent papers by Swales (4), Taylor and Sanderson (5), and Britton (6).

TABLE I

TOLERANCE OF SOME DOMESTIC ANIMALS TO PHENOTHIAZINE

Animal	Therapeutic dose		Tolerated single dose per animal	Toxic resp. lethal dose per animal
	Per lb.	Per animal		
Pig	0.1-0.5 g.	5-30 g.	200-500 g.	.....
Goat	0.05-1 g.	20-30 g.	50-400 g.	.....
Sheep	0.3-1 g.	15-40 g.	400 g.	.....
Calf	0.44-1.1 g.	25-40 g.	50-75 g.	85-200 g.
Horse	0.03 g.	30 g.	500 g.	1,000 g.

The data of table I clearly show the low degree of toxicity of phenothiazine and the favourable ratio between the tolerated dose and the therapeutically active dose. The activity refers to various worm infestations. The corresponding figures for humans suffering from pinworm infestations are approximately as follows:

Therapeutic dose per lb.....	0.07-0.25 gram (1) (2).
Therapeutic dose per individual...	0.5-2 grams (1), 1-8 grams (2).
Tolerated single dose.....	40 grams (2).

Observations made on guinea pigs, rabbits, and other laboratory animals are far less numerous. In experiments of McNaught and his co-workers (7), adult white rats tolerated well oral treatment with small doses of 140 milligrams per kilogram. De Eds and his co-workers (8) fed a diet containing 0.025-0.4 per cent to young rats over a period of 300 days. A certain degree of growth inhibition was found in the group receiving the largest dose. The toxic single dose for rabbits was, according to Taylor and Sanderson (5), 4 grams per kilogram. The authors state that repeated treatment with smaller doses can be more harmful to rabbits than a large single dose. Similar observations are mentioned in experiments with other animals, e.g. with sheep.

The symptoms of phenothiazine poisoning in animals consist mainly of dullness, weakness and inappetence. Necropsy findings revealed inflammation of the stomach and intestines with occasional ulcerations and haemorrhage. In a horse which received one kilogram of phenothiazine producing acute poisoning, haemorrhages and ulcerations of the mucosa of the urinary tract were found (5). Such findings are very uncommon and are recorded only after excessively high doses.

Our experiments were carried out mainly in white mice. The largest single dose administered was 5 grams per kilogram mouse, given as a suspension of purified phenothiazine in 10 per cent gum acacia. Of 30 mice treated with this high dose, only one animal died five days after the treatment, obviously not of poisoning. All other mice survived, showing no signs of distress whatsoever. Repeated treatment with smaller doses was equally well tolerated.

In two separate experiments, groups of 10 mice, with an average weight of 18.8 grams and 19.9 grams respectively, were fed daily with 1.25 grams of phenothiazine per kilogram by means of a stomach tube. In the first group, the average weight was found unchanged after 16 treatments. In the second group the average weight remained unaltered up to the sixteenth feeding but dropped to 16.2 grams after four additional treatments. On post-mortem examination the organs of the killed animals showed no pathological changes. These experiments indicate that white mice tolerate without symptoms a single dose of 5 grams per kilogram as well as a repeated daily dose of 1.25 grams per kilogram to a total of 20 grams per kilogram.

Guinea pigs seem to be more sensitive to phenothiazine. A repeated daily dose of 2 grams per kilogram ingested as a 10 per cent suspension in 10 per cent aqueous polyvinyl alcohol proved to be toxic, leading to loss of weight. The following interesting symptoms were observed during a feeding experiment. The hair on the feet, the legs and the abdomen of the animals

fell out. The skin was coloured pink, as was the neighbouring fur. Baldness and colouring were also observed around the mouth. This suggests that the skin of guinea pigs is sensitive to direct contact with phenothiazine or the oxidation product excreted with the urine. Whether this condition of the skin can be compared with the sensitization to light observed in man handling phenothiazine as an insecticide spray (9) is questionable. The room in which the guinea pigs were kept in cages was not accessible to direct sunlight. Swales (10) could not produce photosensitization in sheep.

ANAEMIA INDUCED BY PHENOTHIAZINE

As mentioned before, anaemia has been observed in three human beings treated with about 20-25 grams of phenothiazine. Similar observations have been made in horses. Under experimental conditions, marked anaemias were induced only in rabbits (5). Thomas and his co-workers (11) found only insignificant anaemia in rats kept on a diet with 0.25-0.3 per cent phenothiazine over a period of one hundred and twenty-five days. The anaemia was somewhat more pronounced after a diet with 0.35 per cent over the same period. The percentage of reticulocytes was increased and the histological examination revealed an increased hematopoiesis. All animals recovered when the treatment was discontinued. In rabbits anaemia was induced by a large single dose of 2.4 grams per kilogram; recovery was completed after three weeks.

The white mice used in our experiments did not show any signs of anaemia, and in the case of the guinea pigs the haemoglobin content of the blood, measured at six intervals, was never below 70 per cent (Sahli). Dogs, however, seem to be fairly sensitive in this respect, and react with anaemia after larger doses of phenothiazine.

The first observation of this kind was made in a fox terrier (dog no. 1) of 10.5 lb. He was treated with 20 grams of phenothiazine given in four daily doses of 5 grams. The haemoglobin content of the blood was 130 per cent before the treatment, and dropped to 40 per cent after the treatment. Thereafter the haemoglobin increased steadily, and reached 100 per cent four weeks after the onset of the treatment. The anaemia did not seem to influence the general condition of the animal, which was very lively and gained 4.5 lb. during the period of observation. Larger doses of phenothiazine, however, induce more severe symptoms of anaemia, as may be demonstrated by the following examples: two dogs, no. 2 of 15.5 lb. and no. 3 of 20 lb., were each treated with a total dosage of 112 grams of phenothiazine per animal, corresponding to about 12.4 and 16 grams per kilogram, respectively.

In the first part of the experiment, between January 15th and February 3rd, a total of 48 grams was fed to each dog. Six daily doses of 5 grams followed by four daily doses of 2 grams led to a marked anaemia which on January 25th showed the haemoglobin at 20 per cent (dog no. 2) and 35 per cent (dog no. 3), compared with the initial figures of 110 per cent and 80 per cent, respectively. The corresponding red cell counts were 1.35 and 2.06 millions. Stained blood smears showed the picture of a progressive anaemia

with anisocytosis, poikilocytosis and the presence of numerous nucleated red cells. In the case of dog no. 2, there was at the height of the anaemia a strong reticulocyte response, showing 25 per cent reticulocytes. At this stage this dog appeared very weak, moved slowly and could get up only with difficulty. The lowering of the dose to 1 gram per day, however, was sufficient to eliminate these symptoms. On February 3rd, after a total dose of 48 grams of phenothiazine had been given to each dog, the haemoglobin figures (37 and 50 per cent) and red cell counts (3.13 and 2.7 millions respectively) indicated a slight improvement.

In the second part of the experiment, after four days' rest, the treatment of the dogs was resumed on February 7th, 4 grams being given daily until an additional 64 grams of phenothiazine had been fed, making a total of 112 grams for each dog. A severe anaemia could not be produced again and the animals continued to be well and active for the period of the experiment. The lowest haemoglobin values recorded during this second part of the experiment were 37 per cent and 53 per cent, respectively. At the end of the treatment the weights of the dogs were found to be practically unchanged. On February 28th, six days after the last administration of phenothiazine, the degree of anaemia in both animals was less, haemoglobin values being 55 per cent and 75 per cent respectively.

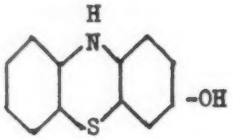
From these experiments it is suggested that dogs stand a prolonged treatment with large doses of phenothiazine without apparent permanent injury. Temporary symptoms of poisoning and a marked anaemia may develop but an increased rate of hematopoiesis tends to overcome the anaemia even when the treatment is continued.

EXCRETION OF PHENOTHIAZINE

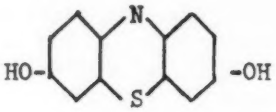
The low toxicity of phenothiazine for man and animals as outlined above is undoubtedly due to the rapid elimination of the drug. According to Swales and Collier (12) and Collier (13), approximately 50 per cent of the ingested phenothiazine is eliminated unchanged in the faeces. The greater part of the balance is excreted in the urine in an oxidized form. Since the elimination in the urine starts shortly after the ingestion of the drug, it is probable that a certain part of the drug is very quickly oxidized in the intestinal tract and absorbed. Oxidized products were found in the blood serum, the concentration curve being almost parallel to that of the urine.

Freshly voided urine is generally not coloured and contains only the colourless intermediates of a dye-stuff. Exposed to air, the urine turns red by oxidation; the red dye-stuff thus formed is presumably thionol. There seems to be a difference in the elimination in man and in sheep. Evidence is brought forth in Collier's experiments that the main product to be found in serum, milk or urine of sheep is an ethereal sulphate of leucophenothiazone (formula III), while according to Thomas and his co-workers (14) the urine of rats, rabbits and men contains leucothionol (formula IV) and thionol (formula II) besides conjugates of phenothiazine and leucothionol. Unchanged phenothiazine could be isolated.

Our studies do not permit the discussion of this difference in eliminated oxidation products of phenothiazine at the present moment. But since the red colour of urine after treatment with phenothiazine may sometimes be alarming to patients and physicians, an example of the elimination in human beings may be given.



III
Leucophenothiazone



IV
Leucothionole

FORMULAE III AND IV

In accordance with the observations in humans and in animals, the excretion of oxidized phenothiazine starts shortly after the ingestion of the drug. The urine is in most cases clear and of normal colour, but becomes red on standing in contact with air. For determining the total amount of soluble phenothiazine derivatives present in the urine, the following technique was used: To 1 cc. of urine, diluted with 7 cc. of water, 1.5 cc. of concentrated hydrochloric acid and 0.5 cc. of a 30 per cent solution of hydrogen peroxide are added. After twenty minutes' standing the thionol formed is determined by colorimetric comparison with thionol solutions of known concentration, freshly prepared from a 0.1 per cent stock solution of thionol in absolute alcohol.

It may be seen from table 2 that a single dose of 1.5 grams of pheno-

TABLE II

EXCRETION OF SOLUBLE PHENOTHIAZINE DERIVATIVES
COLORIMETRIC DETERMINATION AS THIONOL
Male patient, 160 lbs.
Treatment: 1.5 grams of phenothiazine per os

Time after treatment		Colour of urine		Thionol mg. percentage
Hours	Minutes	Fresh	After oxidation	
0	35	yellow	purplish tinge	2.5
2	45	yellow	purplish red	100.0
6	25	reddish	purplish red	50.0
8	30	yellow	purplish red	25.0
11	35	yellow	light purple	10.0
14	10	yellow	light purple	7.5
22	30	yellow	light purple	12.5
25	25	yellow	purplish red	50.0
27	35	yellow	light purple	25.0
38	10	yellow	light purple	17.5
48	50	yellow	light purple	7.5
54	20	yellow	purplish tinge	<2.5

thiazine was almost completely excreted within fifty-four hours. During the first eight hours, the elimination was considerable; then it diminished, but reached a second peak after twenty-five to thirty hours. This second elevation was more or less marked in three experiments out of four. Traces of oxidized phenothiazine were excreted for a longer period. After a single dose of 1.5 grams four or five days usually elapsed before the drug could no longer be detected. After larger doses, e.g. 5.5 grams given during four days, the elimination was completed six days after the last dose, but on the fourth and fifth day only traces of the drug could be found.

These results are in accordance with observations made in animals treated with much larger doses. They show that, while the bulk of the drug is eliminated within the first forty-eight hours, small amounts of the drug may remain in the body three to five days longer.

DISCUSSION

The experiments described in the present paper show the low toxicity of phenothiazine, confirming the results derived from practical experience in domestic animals. The manifestations in different animals of the toxic action of excessively large doses are of course different. Guinea pigs are somewhat more sensitive than mice. Dogs tolerate very large doses of phenothiazine with only occasional symptoms of distress and a temporary anaemia.

It seems that the low toxicity of phenothiazine is due to the absence of nuclear substitutions. Substituted derivatives of phenothiazine, e.g. thionol or thionin (Lauth's violet, 3, 6, diaminophenothiazine), are at least twice as toxic as phenothiazine.

It is surprising that an unsubstituted thiazine, containing no chlorine, no keto or quinone groups, no lactone structure—in short, none of the so-called "active anthelmintic groups" besides the secondary amino group—has any activity. The derivatives of higher toxicity, formed in the body, such as phenothiazone or thionol, possess other properties. The dye-stuff thionol is bactericidal (De Eds and co-workers, 3 and 14), phenothiazone is a fungicidal agent (Goldsworthy and Green, 15), and it is assumed that the insecticidal activity of phenothiazine is also due to the oxidation products. Possibly the anthelmintic effect is due to the presence of the unchanged drug in the intestine, but this view requires experimental proof.

It should be mentioned in this connection that Guthrie (16) states in a recent paper that diphenylamine has an anthelmintic activity upon nematodes in dogs. This compound is the starting material for the preparation of phenothiazine but there is no evidence so far that diphenylamine might be the active principle of the anti-parasitic activity of phenothiazine.

SUMMARY

1. A method of purifying technical phenothiazine has been developed.
2. The toxicity of purified phenothiazine was studied in white mice,

guinea pigs and dogs. Guinea pigs are somewhat more sensitive to this drug than mice.

3. Large doses of phenothiazine produce anaemia in dogs. This anaemia has a good tendency towards complete reparation.

4. Phenothiazine is readily eliminated. The oxidation products appear in the urine shortly after the ingestion of the drug, and the excretion is completed after three to five days.

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Restaurant Personnel and Methods*

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FOOD handlers play an important role in maintaining the health of the community. This term includes those in stores who handle foodstuffs not put up in hermetically sealed cans or bottles, the waitress and the chef in the restaurant, the dairy employee, and the iceman, etc. It is the duty of the health department and the sanitary inspector to instruct food handlers concerning the danger of food-borne diseases and their prevention. It is important that consumers know what is expected of food handlers in the way of personal hygiene and preventive measures. The inspector may be efficient in observing conditions which may be very dangerous but this will avail him nothing if the vehicle or food handler harbours an infection or if the food handler has already conveyed the infection innocently by an act such as coughing or sneezing. If the food handler has a communicable disease which can be transmitted to others through food, there is obviously a possibility that the consumer may contract this infection. This is particularly applicable to foodstuffs which are uncooked—for instance, milk. In lunch counters a small jug of cream is usually served with tea and coffee. The method commonly employed is to fill this jug by pushing down the cap of the milk or cream bottle with the index finger and, with another movement, allowing the contents to flow over the top of this digit and into the receptacle. This practice should be condemned.

There are many ways in which infection can be conveyed to the consumer by the food handler. Utensils such as spoons and forks or drinking glasses may be contaminated by handling, even though they were properly sterilized. It is important that the method of handling utensils and dishes after cleansing and sterilization should be given consideration. It is difficult to estimate fully the extent to which communicable disease carriers among food handlers contribute to the spread of the disease. It does, however, seem reasonable to suppose that if it definitely can be spread by one of many acts of omission, the contribution may be greater than is commonly supposed. Personal cleanliness for food handlers is a fundamental principle which must be enforced. The hands may become contaminated with discharges from the nose, mouth, throat and gastro-intestinal tract. If the hands are to be thoroughly washed, hot running water, soap from a liquid-soap dispenser, individual nail brushes, and individual paper towels are necessary. The finger nails should not be long and should be free from dirt at all times. If general food inspection as a measure of disease prevention is to be worth even a part of what it costs, it is obvious that emphasis must be put upon protection against the disease dangers

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known to exist in the persons of food handlers rather than upon remote health dangers possibly inherent in food itself. In better-class restaurants, however, hygiene regulations compiled by someone in authority are enforced. They refer particularly to washing of hands periodically, and general appearance of the personnel.

The next important step is the systematic inspection of food stores and restaurants. It will be necessary to assume that the better-class establishments will not require the same supervision as the lower-class stores. The standard set by the better one cannot be the standard which governs the lower one; each restaurant should be judged according to its own standard and the inspector should be very tactful in his judgment. Much can be accomplished by careful consideration of each establishment in the community. The day is long past when the inspector's gruff request was a demand which warranted immediate action and at the same time antagonized the occupant. Much more will be gained and a better community spirit prevail if we, firmly, but courteously, give our advice according to the regulations.

A community having several inspectors should assign to a particular district one inspector for routine inspections. This person should not remain too long in one area as he is likely to become so accustomed to a fixed route and the same contacts that he loses his sense of values. He may also become too familiar with the occupants and consequently his effectiveness in correcting conditions is considerably lessened.

STORAGE OF FOODS

Many foods at room temperature serve as excellent media for the growth of certain disease-producing organisms. Great care must be taken in the preparation and storage of cream-filled pastry, meats, and other foods. Foods not for immediate consumption should be placed under refrigeration and covered to prevent evaporation of moisture from the food and to eliminate odours in the refrigerator. Containers of glass, enamel and earthenware can be secured for this purpose. A cover for each should be provided (1).

All foods should be given individual service. Serving forks, tongs, spoons and other implements should be used to handle certain types of foods. Persons preparing salads, sandwiches, and foods to be eaten unheated, should take the maximum precautions to prevent touching the ingredients with their hands (2).

Dealers in food generally are not acquainted with the aspects of handling, storing, or manufacturing of foods, nor the reasons for the regulations promulgated to control these conditions. A program of education, whereby representatives of food organizations may attend to meetings of their respective groups, should be inaugurated. Such meetings tend to promote understanding and better co-operation between food dealers and the health department.

CLEANSING AND STERILIZATION OF UTENSILS AND DISHWARE

This particular phase of restaurant service is one of the most important. Although from practical experience anyone can wash dishes, the individual per-

forming this task should be chosen very carefully. To ensure this, the manager or owner of the restaurant should be approached and an explanation given of the importance of the proper cleansing and sterilization of utensils and dishes. The task of dishwashing is not a menial job; it is one of the most important phases in catering to the general public and the restaurateur owes this service to the community in which he serves. The type of detergent used for cleansing and the chlorine compound used for sterilizing should be given consideration. There are many types of powders suitable but the water used for washing should be chemically analysed in each municipality and a suitable powder recommended by a reliable authority.

At the present time, thorough sterilization of all dishes and utensils is not merely a desirable service—it is a duty. Not all restaurants have modern sterilization equipment but they should realize that such equipment is essential in any plan of modernization that deserves the name. Lacking such equipment, any eating place can have boiling water available and can easily find out how to sterilize dishes and utensils with it.

Tables and chairs should have frequent treatment of boiling water plus a suitable disinfectant. Equal care should be exercised to ensure sterile cleanliness in the kitchen, both in regard to cooking utensils and the sanitary disposal of garbage. Adequate disinfection of wash rooms is also a necessity.

The container for the ice-cream scoop, which is usually located on the lunch counter, is a fixture which if not given careful attention can become useless and not fulfill the purpose for which it was intended (3). In some instances, particularly at soda fountains, the container has a constant stream of fresh water flowing in from the top. This type is no more satisfactory than the common vessel because the stream entering at the top is not sufficient in volume or in force to change more than the surface of the water, and the heavier ice-cream deposits are left in the bottom of the container. Furthermore, these overflow pipes often become blocked because the water may not be running. This allows the butterfat to congeal, thereby blocking the pipe. It would be more satisfactory if the water supplying the scoop-bath were hot. This would prevent the butter fat from solidifying and most of it would be carried off into the overflow and the chance of blockage and contamination would be more remote.

INSPECTION

Effective food control requires constant and intelligent inspection of the food-handling operations. Inspectors must make visits to the premises to observe whether the rules and regulations under the law are being complied with. The inspector should be so thoroughly trained that he is aware of infections and knows how to eliminate them. He should endeavour to prevent a recurrence of the condition. The inspector's work is definitely more effective when he knows more about the work than the operators do.

This inspection of premises and food-handling operations is necessary because some types of violations cannot be ascertained merely by the examination of samples of the product. For example, violation of the requirements

that toilets should not be located in food-processing rooms or that the personnel should be free from communicable disease could never be discovered by only the laboratory examination of samples from the plant which violated these requirements. Inspections may reveal unsafe plumbing connections.

Restaurants should be screened to exclude flies and a determined effort be made to eliminate the flies which are already in the premises. Rat holes should be closed to prevent rodents gaining access to a building; any inside the building should be destroyed by trapping or poisoning. In restaurants in general, the cockroach is usually present. Its control will depend on the ability and determination of the person operating the establishment to prevent such infestation. The inspector must know the possible location of these pests to enable him to pass judgment on the general sanitary conditions prevailing. The environment suitable for the cockroach is a warm, moist atmosphere, usually in a cupboard near the stove or radiator, particularly if food is stored in the cupboard. Elimination of this insect may be accomplished by spraying with a suitable solution and paying strict attention to incoming foodstuffs as cockroaches are very often carried into the premises in boxes and cartons which have been stored prior to distribution.

Better co-operation between the local sanitation department and the association representing restaurants in general would undoubtedly create a movement which would benefit the community.

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1. Marden, Katherine, and others: Administrative Control of Food Handlers and Places Dispensing Food and Drink, Am. J. Pub. Health, 1938, *28*:1277.
2. Lichterman, A.: Supervision of Food in New York City, Am. J. Pub. Health, 1938, *28*:845.
3. Krog, Andrew J., and Dougherty, Dorothy S.: Scoops as a Source of Contamination of Ice Cream in Retail Stores, Am. J. Pub. Health, 1937, *27*:1007.

EDITORIAL SECTION

THE DEVELOPMENT OF COUNTY HEALTH UNITS IN QUEBEC

THE story of the development of full-time county health units in the Province of Quebec constitutes one of the most interesting and important chapters in the record of public health progress on this continent. Recognizing the inadequacies of health services provided by local part-time medical officers, the Province of Quebec has, during the past fifteen years, provided full-time health services for more than seventy-five per cent of its rural population. The first unit was established in Beauce County in February 1926. Today forty-nine units are serving sixty-one counties, leaving only a few counties to be organized. Although Quebec was not the first province in Canada to establish this form of health administration, in no other province has such rapid and substantial progress been made.

It is interesting to recall that the need for replacing the system of local boards of health by a plan in which municipalities would be associated on a county-wide basis to provide health services was strongly urged by Dr. Alphonse Lessard when he assumed his duties as director of the Provincial Bureau of Health, forerunner of the present Ministry of Health, in 1923; and it was under his leadership that the first units were established. The formation of these units was facilitated by the generous co-operation of the Rockefeller Foundation, through its International Health Division, which had assisted also in establishing full-time health units in British Columbia. It must indeed be gratifying to the Rockefeller Foundation to know that the demonstrations of this type of health administration which they made possible in various parts of the United States and Canada have established the value of the full-time health unit; and to see, in particular, the splendid accomplishments of the Ministry of Health of the Province of Quebec.

It has been due to the effective steps taken by the Ministry that trained public health personnel have been available to meet the rapidly expanding requirements of the province. To recruit and train the large number of medical officers, public health nurses, and inspectors required has been an achievement of which the Ministry may well be proud. At present the personnel of the units numbers more than three hundred. Only qualified medical officers and nurses are appointed.

Undoubtedly a highly important factor in the rapid development of the movement for full-time health services in Quebec has been the provision of the major part of the cost from Provincial funds. The budgets of the units range from ten to fifteen thousand dollars a year, and the amount is provided in part by the levy of a county tax of one and a half cents per hundred dollars' evaluation of taxable property in the county, the balance being met by the Province. Although legislation passed in 1933 empowered the Ministry to order the establishment of health units, no need has arisen to enforce this legislation. Indeed, requests for the organization of units have exceeded the ability of the Ministry to provide the necessary trained personnel.

This demonstration of the importance of adequate financial support in the organization of full-time health units brings prominently into view the need for Federal assistance to the Provincial Governments for preventive health services. Several of the Provinces are quite unable to forward such plans because of their inability to implement financially the necessary organizations. While not ignoring the needs of the many aspects of a well-rounded public health program, they are able to emphasize one. In one province it is county health units, in another it is tuberculosis control, and so on. The establishment of a comprehensive provincial health service in all provinces can only be implemented by Federal assistance.

RESIGNATION OF MISS CHARLOTTE WHITTON AS DIRECTOR OF THE CANADIAN WELFARE COUNCIL

ANNOUNCEMENT was made this month of the resignation of Miss Charlotte Whitton, C.B.E., M.A., D.C.L., LL.D., as director of the national body now known as the Canadian Welfare Council. Miss Whitton, who is internationally known as a welfare worker, became honorary secretary of the Council when it was established, and after an interval during which she was secretary to the Dominion Minister of Trade and Commerce she assumed in 1926 the position of director of the Council. Serving at first as a national organization concerned with child welfare, the Council steadily widened its field of interest under her direction and has become virtually a national council of social agencies. In 1934 Miss Whitton was made a Commander of the Order of the British Empire. In 1939 she was honoured by King's College, Halifax, with the degree of Doctor of Civil Laws, and just recently her alma mater, Queen's University, conferred upon her the degree of Doctor of Law.

Miss Whitton has resigned in order to undertake even wider responsibilities in social welfare. The best wishes of the Association are extended to her in her new field of work.

ASSOCIATION NEWS

The Thirty-first Annual Meeting

THE thirty-first annual meeting of the Canadian Public Health Association will be held in the Royal York Hotel, Toronto, on Monday, Tuesday and Wednesday, June 1st, 2nd and 3rd, under the presidency of Dr. J. J. McCann, M.P. The twenty-eighth annual conference of the Ontario Health Officers Association will be held concurrently.

The Christmas Meeting of the Laboratory Section

The tenth Christmas meeting of the Laboratory Section was held in the Royal York Hotel, Toronto, on Wednesday and Thursday, December 17th and 18th, with an attendance of slightly more than one hundred. Those present included representatives of the Department of Pensions and National Health, the Department of National Defence, and the Department of Agriculture, Ottawa; the Departments of Health of British Columbia, Alberta, Manitoba, Ontario, Quebec, and Nova Scotia; the Universities of British Columbia, Alberta, Manitoba, Western Ontario, Toronto, Queen's and McGill; Mountain Sanatorium, Hamilton, Camp Borden Military Hospital, and Belleville General Hospital; the Lilly Research Laboratories, Indianapolis; the New York State Department of Health, and Difco Laboratories Incorporated, Detroit. There were also many members present from the various research and teaching institutes, including the School of Hygiene and Connaught Laboratories, the Banting Institute, the Ontario Research Foundation, the Ontario Veterinary College, the Institute of Public Health, London, and the Animal Diseases Research Institute, Hull.

Although the Section officers, in planning the meeting this year, were uncertain of the response, since few of the members are now able to devote much of their time to research, the number of papers was only one less than last year. Twenty-four papers were presented during the three general sessions, and one afternoon was given to a program of demonstrations and films. The chairman of the Section, Dr. C. E. Dolman, Director of the Division of Laboratories for the Provincial Board of Health of British Columbia and Head of the Department of Bacteriology and Preventive Medicine in the University of British Columbia, was the speaker at the annual dinner and reviewed the changing place of the laboratory in public health. His address will be published in an early issue of the JOURNAL. The dinner meeting also afforded the members an opportunity to see an excellent film in colour on the life-history of the Rocky Mountain wood tick, prepared by the United States Public Health Service and shown through the courtesy of Dr. R. R. Parker, Director of the Rocky Mountain Laboratory at Hamilton, Montana.

The following officers were elected for 1942: Chairman, Dr. D. J. Mackenzie, Halifax; vice-chairman, Dr. Fred Cadham, Winnipeg; and secretary, Dr. Ronald Hare, Toronto. The Section Council comprises Dr. G. D. W. Cameron, Ottawa, Mr. M. H. McCrady, Montreal, and Dr. R. M. Shaw, Edmonton; and the Local Committee on Arrangements, Dr. D. T. Fraser, Dr. P. H. Greey, and Dr. A. L. MacNabb, Toronto.

The Canadian Health Conservation Contests

Eighteen full-time health units and thirteen cities have enrolled in the 1941 Canadian Health Conservation Contests, conducted by the Canadian Public Health Association in co-operation with the American Public Health Association. The closing date for enrolment is January 31st and it is expected that a number of other cities and counties will submit formal notice of their application before that date.

The cities which have enrolled in

the City Contest, and their medical officers, are as follows:

British Columbia: Greater Vancover Metropolitan Health District (Dr. Stewart Murray).

Manitoba: St. Boniface Health Unit (Dr. Paul L'Hereux).

Ontario: Hamilton (Dr. J. Edgar Davey), Niagara Falls (Dr. Harris Logan), Owen Sound (Dr. L. J. Sutherland), St. Catharines (Dr. D. V. Currey), City of Windsor and Town of Riverside (Dr. John Howie).

Quebec: Hull (Dr. F. Labrecque), Lachine (Dr. Albini Jeannotte), Montreal (Dr. Adelard Groulx), Trois Rieres (Dr. Jean Paul Beaudet), and Verdun (Dr. A. D. Archambault).

New Brunswick: Saint John (Dr. Arthur F. Chaisson).

The following full-time health units have enrolled in the Rural Contest:

British Columbia: Peace River (Dr. R. J. Macdonald).

Alberta: Foothills (Dr. A. Somerville), Red Deer (Dr. C. L. Pearson), and Stettler (Dr. M. B. Donaldson).

Manitoba: St. James-St. Vital (Dr. E. A. Campbell).

Quebec: Arthabaska (Dr. J. Octave Roy), Beauce (Dr. C. Pomerleau), Brome-Missisquoi (Dr. E. Jacques), Drummond (Dr. Roger Beauvilliers), Kamouraska-L'Islet (Dr. Rodolphe Deschenes), Labelle (Dr. Albert Dumas), Laviolette (Dr. E. Frenette), Nicolet (Dr. Jean Paquin), Riviere du Loup-Temiscouata (Dr. J. Sarto Sirois), St. Hyacinthe-Rouville (Dr. D. Auger), St. Jean-Iberville-Laprairie-Napierville (Dr. Alphonse Lapierre), Rimouski (Dr. Omer Leclerc), and Shefford (Dr. Jules Gilbert).

Application blanks and further information are available from the Association's offices, 111 Avenue Road, Toronto. The results of the Contests will be announced in the April issue of the JOURNAL and the awards will be presented to representatives of the cities and rural units during the annual meeting of the Association in Toronto, June 1st to 3rd.

Holders of the Certificate in Sanitary Inspection (Canada)

Two hundred and thirty-seven inspectors have obtained the *Certificate in Sanitary Inspection* (*Canada*) since the examinations were introduced by the Association in 1935. The complete list of those to whom the Certificate has been granted is published in order that it may be available for the reference of health departments. While most of those whose names are listed are employed, the Committee on the Certification of Sanitary Inspectors will be pleased to supply to health departments a list of qualified inspectors who are available for appointment.

HOLDERS OF THE CERTIFICATE IN SANITARY INSPECTION (CANADA)
C.S.I.(C.)
GRANTED BY THE CANADIAN PUBLIC HEALTH ASSOCIATION

Alcock, Frederick Raymond, Vancouver, B.C., 1941
Allen, John Harold, Toronto, Ont., 1940
Archambault, Joseph Fortunat Rene, Montreal, Que., 1939
Armstrong, Linton William, Lachute, Que., 1939
Armstrong, William James, Regina, Sask., 1941
Badger, Franklin Thomas, Toronto, Ont., 1938
Baker, Frederick, Winnipeg, Man., 1940
Baker, Vernon Samuel, London, Ont., 1938
Bastien, Wilfrid, Montreal, Que., 1941
Batty, William Clement, Edmonton, Alta., 1937
Beaubien, L. Auguste, Nicolet, Que., 1938
Belanger, Joseph Albert, Montreal, Que., 1936
Belleau, François-Joseph, Montreal, Que., 1941
Benoit, Victor, Montreal, Que., 1940
Bibeau, Emmanuel, Montreal, Que., 1939
Bishop, William Hunter, Toronto, Ont., 1940
Black, William Murray, Vancouver, B.C. 1937
Blacklin, Henry, Vancouver, B.C., 1936
Bond, Ziba, Toronto, Ont., 1936
Bouchard, Albert, Montreal, Que., 1941
Bouchard, Garcia, Montreal, Que., 1938
Boucher, Armand, Montreal, Que., 1941
Boucher, Paul, Montreal, Que., 1941
Boyd, Robert, Todmorden, Ont., 1939

Boyd, William Clarence, Todmorden, Ont., 1941
Bridges, Wallace Roy, Winnipeg, Man., 1940
Brunelle, François, Montreal, Que., 1939
Buckley, Gilbert, Toronto, Ont., 1939
Burch, Charles Herbert William, Vancouver, B.C., 1939
Carbonneau, Joseph Marc Aurele, Montreal, Que., 1939
Carmichael, John Stephen, Winnipeg, Man., 1941
Cavers, John Leonard, Toronto, Ont., 1936
Chisholm, William Joseph, Glace Bay, N.S., 1940
Clarey, Albert, Hamilton, Ont., 1937
Clegg, Warren Leach, Hollyburn, B.C., 1937
Cluney, James, Galt, Ont., 1939
Cockle, Arthur Boon, Vancouver, B.C., 1937
Colling, Robert Arthur, Toronto, Ont., 1937
Collins, Harry Percy, Vancouver, B.C., 1939
Cooke, Albert Edward, Toronto, Ont., 1937
Cox, Thomas P., Hamilton, Ont., 1938
Cowey, John, Calgary, Alta., 1937
Craig, Robert Arthur, Winnipeg, Man., 1938
Crichton, James Harold, Calgary, Alta., 1938
Cross, Alexander, Winnipeg, Man., 1938
Cross, Gordon Edward, Montreal, Que., 1938
Curtis, Wilfrid A., Hamilton, Ont., 1939
Daignault, J. Eugene, Montreal, Que., 1939
Daniels, Howard, Winnipeg, Man., 1941
Dennison, Harry, Toronto, Ont., 1937
Desalliers, Philippe, Montreal, Que., 1941
Desjardins, Jules Antoine, Montreal, Que., 1939
Devine, Reginald Patrick, Vancouver, B.C., 1936
Dicaire, Arthur, Lachine, Que., 1935
Disher, Dalton M., St. Catharines, Ont., 1941
Dodgson, Lloyd I., Toronto, Ont., 1938
Doidge, William George, London, Ont., 1938
Downes, George Lewis, Toronto, Ont., 1937
Drew, Harry, Windsor, Ont., 1941
Edwards, George Harold, Guelph, Ont., 1937
Enman, Vernon, Vancouver, B.C., 1936
Ewan, Morven, New Westminster, B.C., 1941
Fairhurst, Stanley, Victoria, B.C., 1935
Farrell, John James, Summerside, P.E.I., 1939
Flattery, Mark, The Pas, Man., 1938
Fleetwood, Ernest Hall, Calgary, Alta., 1937
Ford, Ellis Eric, Vancouver, B.C., 1941
Ford, Robert George, Toronto, Ont., 1938
Forget, Bertrand, Montreal, Que., 1941
Forté, Louis-Georges, Montreal, Que., 1939
Fournier, Sarto, Granby, Que., 1939
Fox, Louis Samuel, Toronto, Ont., 1937
Fuller, Joseph, Vancouver, B.C., 1937
Fyfe, Oliver Simmons, Regina, Sask., 1937
Garon, J. Roméo, Montreal, Que., 1940
Gaudet, Paul, Montreal, Que., 1941
Gaudette, Joseph Wilfrid, St. Hyacinthe, Que., 1938
Gent, Ernest Clifford, Toronto, Ont., 1938
George, Stanley William, Vancouver, B.C., 1936
Gibbon, Harry Ray, Toronto, Ont., 1937
Gibbons, Percy William, Saskatoon, Sask., 1940
Gilbert, Ronald, Prince Albert, Sask., 1938
Gompf, George Alfred, Hamilton, Ont., 1937
Gonneville, Joseph Pierre Armand, Montreal, Que., 1939
Goodwin, Bramwell Booth, Winnipeg, Man., 1940
Goulding, Walter, Calgary, Alta., 1937
Gracey, Alexander Albin, Vancouver, B.C., 1937
Graham, David McKee, Winnipeg, Man., 1940
Grant, Allister, Sydney, N.S., 1939
Gray, William, Toronto, Ont., 1939
Griffith, Joseph L., Toronto, Ont., 1941
Gropp, Elwood Stanley, Victoria, B.C., 1936
Hammond, Maurice L., Toronto, Ont., 1940
Hancey, Laurence H., Toronto, Ont., 1938
Harris, Sidney, Geraldton, Ont., 1938
Harrison, Albert James, Toronto, Ont., 1936
Hawksworth, Eric, Winnipeg, Man., 1938
Heasman, Sidney Philip, Vancouver, B.C., 1936
Henderson, James, Medicine Hat., Alta., 1937
Henderson, Walter Graham, Moose Jaw, Sask., 1937
Henderson-Watts, Henry George, Kelowna, B.C., 1936
Hill, William Stanley, Toronto, Ont., 1936
Hinton, Arthur Cowan, Vancouver, B.C., 1940
Holmes, Charles Ross, Walkerville, Ont., 1938
Homer, John Malcolm, Hamilton, Ont., 1937
Hotté, Joseph Albert, Montreal, Que., 1939
Huband, Charles Stanley, Ottawa, Ont., 1938
Hughes, Ralph Philip, Ottawa, Ont., 1938
Hunter, Louis John, East Kildonan, Man., 1937
Ireson, Charles, Toronto, Ont., 1936
Jackson, Reginald, Calgary, Alta., 1936
Jackson, Thomas Henry, Toronto, Ont., 1935
Jamieson, Hugh, Swift Current, Sask., 1935
Johnson, Dudley George, Winnipeg, Man., 1938
Johnston, Hugh John, Winnipeg, Man., 1941
Johnston, James M., Toronto, Ont., 1939
Jones, Trevor Lloyd, Guelph, Ont., 1937
Keirstead, William Percy, Moncton, N.B., 1936
Kelly, George Wilfrid, Winnipeg, Man., 1939
Kennedy, John Lawrence, Hamilton, Ont., 1938
Kennedy, Mansell Harcourt, Moose Jaw, Sask., 1937
Keown, Gordon Harry, Vancouver, B.C., 1938
Kidson, Ernest Jack, Penticton, B.C., 1941
Kindred, Robert William, Toronto, Ont., 1936
Kinniston, Samuel Clarkson, Vancouver, B.C., 1937
Lackie, Thomas Hall, Winnipeg, Man., 1940
Lacombe, Genere, Grand'Mère, Que., 1939
Lapointe, Aldéric, Montreal, Que., 1939
Larochelle, Philéas, Chicoutimi, Que., 1939
Lavoie, Thomas Odilon, Montreal, Que., 1938
Laxton, Nelson Roland, Toronto, Ont., 1938
Lee, John Douglas, Vancouver, B.C., 1937
Leggatt, William Albert, Calgary, Alta., 1937
Lemieux, Charles André, Montreal, Que., 1941
Lomax, Arthur Henry, Hamilton, Ont., 1937
Love, Archibald Peter, Windsor, Ont., 1936
Lund, Eric William, Toronto, Ont., 1940
McCullough, Alexander, Vancouver, B.C., 1935

McDonald, Alexander Williams, Toronto, Ont., 1935
McDonald, Donald, Toronto, Ont., 1937
McFaul, Harold Henderson, Toronto, Ont., 1940
McIntyre, Hugh, Kirkland Lake, Ont., 1937
McKee, David Samuel, Toronto, Ont., 1938
Mackie, Angus Donald, Vancouver, B.C.,1941
McLaughlin, Gordon Earl, Kamloops, B.C., 1939
Macnab, Arthur Goudie, Mount Royal, Que., 1937
MacPherson, Ronald Michael, Peterborough, Ont., 1938
MacRae, John Harold, Prince Albert, Sask., 1941
Mallett, Arthur William, Vancouver, B.C., 1939
Mallett, Clifford, Vancouver, B.C., 1938
Mardall, John Pinnock, Toronto, Ont., 1937
Marson, William David, Toronto, Ont., 1936
Martel, Edgar, Montreal, Que., 1939
Martin, Arthur Thomas, Winnipeg, Man., 1938
Matthews, Melville Francis, Toronto, Ont., 1936
Meehan, James, Timmins, Ont., 1939
Meredith, Robert Boyd, Grande Prairie, Alta., 1941
Miller, Thomas Gordon, Windsor, Ont., 1936
Moisey, William Alexander, Edmonton, Alta., 1939
Mooney, John Charles, Calgary, Alta., 1936
Moore, David Ernest, Kenora, Ont., 1940
Moore, Robert Lionel, Toronto, Ont., 1938
Moreau, Charles, St. Anselme, Que., 1941
Morrell, John Fordham, Vancouver, B.C., 1941
Muller, Cyril Gustave, St. Boniface, Man., 1937
Navion, Wilfrid, Ottawa, Ont., 1939
Neill, Thomas, Toronto, Ont., 1936
Newall, Percy Swain, Saskatoon, Sask., 1940
Nixon, Murray Charles, Toronto, Ont., 1941
O'Hanley, John, Hamilton, Ont., 1938
O'Hara, Alexander Stuart, Kenora, Ont., 1935
Osborne, William John Earl, Windsor, Ont., 1936
Owen, Owen William, Toronto, Ont., 1938
Paddon, John Reginald, Vancouver, B.C., 1941
Paré, Joseph Avila, Montreal, Que., 1939
Payette, Peter J., Cornwall, Ont., 1939
Peers, Arthur Ross, North Vancouver, B.C., 1939
Pengelly, Norman Edward, New Westminster, B.C., 1938
Pettipas, Charles Thomas, Dartmouth, N.S., 1935
Picton, Ernest James, Hamilton, Ont., 1937
Pillidge, Wallace, Calgary, Alta., 1936
Pillidge, Wallace, Calgary, Alta., 1937
Powell, Edgar Ernest Charles, Edmonton, Alta., 1937
Powell, George Hunter, Toronto, Ont., 1938
Proud, John Ellis Wilson, Vancouver, B.C., 1937
Pye, Sydney, Toronto, Ont., 1939
Racklin, Lawrence L., Winnipeg, Man., 1939
Rancourt, Joseph Odilon, Montreal, Que.,1941
Reed, William Ceary Nelles, Regina, Sask., 1937
Reid, John Henry, Calgary, Alta., 1936
Reusch, Harold Percy, Vancouver, B.C., 1940
Richards, Eric Herbert, Calgary, Alta., 1940
Roberts, Albert, Regina, Sask., 1937
Robertson, Laurence Edward, Vancouver, B.C., 1937
Robitaille, Raymond John, Montreal, Que., 1939
Rogers, George Alexander, Vancouver, B.C., 1936
Rose-Christensen, I., Winnipeg, Man., 1941
Rothery, Frank, Sudbury, Ont., 1939
Ruggles, Arthur Edwin, Toronto, Ont., 1936
Ruggles, Robert Walter, Toronto, Ont., 1936
Sadoway, Donald, Toronto, Ont., 1939
Shain, Aubrey Charles, Hamilton, Ont., 1937
Sharp, Harold, Toronto, Ont., 1938
Shorrock, Walter Walmsley, Vancouver, B.C., 1939
Shutt, Donald Bethune, Guelph, Ont., 1938
Skinner, Robert, Vancouver, B.C., 1936
Slaght, Lorne, Winnipeg, Man., 1937
Smith, James Ketchener, Vancouver, B.C., 1936
Smith, William Lapslie, Toronto, Ont., 1938
Southen, Edwin John, North Vancouver, B.C., 1938
Southon, Edgar Gilbert, Swift Current, Sask., 1935
Stanley, Ernest Victor, Calgary, Alta., 1938
Staples, Wilfrid Charles, Toronto, Ont., 1938
Startup, Reginald, Vancouver, B.C., 1936
Steiman, Manley Manuel, Winnipeg, Man., 1940
Stonehouse, Claude Randall, North Vancouver, B.C., 1941
Stringer, John Alfred, Vancouver, B.C., 1939
Stringer, Russell Irvine, Vancouver, B.C., 1941
Sutton, Charles Edward, Moose Jaw, Sask., 1937
Taylor, Elmore Dixon, Brantford, Ont., 1939
Taylor, Thomas Nicholas, Vancouver, B.C. 1938
Taylor, Wilfred, Winnipeg, Man., 1937
Tyler, Herbert George, Toronto, Ont., 1937
Van Engel, Conrad Evert, Winnipeg, Man., 1937
Veilleux, Joseph B., Beauceville, Que., 1941
Waghorn, Thomas George, Brockville, Ont., 1938
Wallace, William C., Kingston, Ont., 1939
Wattam, Clare Elson, Toronto, Ont., 1936
Weis, Jacob Edward, Stratford, Ont., 1935
Welsh, Milford A., Swift Current, Sask., 1941
Welsh, Robert Edward, Toronto, Ont., 1940
Westover, William George, Weston, Ont.,1940
Widdup, Arthur, Hamilton, Ont., 1937
Witherspoon, Robert Wilfrid, Hamilton, Ont., 1939
Wood, Donald James, Peterborough, Ont., 1938
Wookey, William Stanley, Vancouver, B.C., 1941
Young, Gordon Thomas, London, Ont., 1939

PUBLIC HEALTH ADMINISTRATION

Conference on Orthopaedics

THE seventieth annual meeting of the American Public Health Association, held in Atlantic City, October 13-17, 1941, was preceded by a group conference on orthopaedics arranged by the National Organization for Public Health Nursing. Miss Jessie L. Stevenson, Consultant in Orthopaedic Nursing, N.O.P.H.N., led the group, which was limited to thirty nurses actively engaged in crippled children's work. Sixteen States of the Union were represented, and also the Province of Ontario. Subjects were discussed under such headings as developing interest in crippled children's programs, correlation of services and interchange of information, responsibility of the nurse in relation to the care of patients with specific orthopaedic conditions such as poliomyelitis, cerebral palsy, etc., preparation and qualifications for orthopaedic nursing, and staff education. The discussions were most interesting, Miss Stevenson giving stimulating leadership. Small groups with similar problems met at lunch or dinner. On the day following the two-day conference, an opportunity was given any member who wished to meet Miss Stevenson and obtain practical advice in dealing with some local situation in the nurse's own community.—*Gretta M. Ross, Reg. N.*

The Manitoba Health Officers Association

THE first meeting of the Executive Committee of the Manitoba Health Officers Association, which was formed in June, 1941, was held in the Library of the Manitoba Medical College, Winnipeg, on November 5th. Dr. George Clingham, of Virden, is president of the Association, and the vice-presidents are Dr. M. S. Lougheed of Winnipeg and Dr. E. S. Bolton of Brandon. The members-at-large include Dr. H. A. Gordon of Portage La Prairie and Dr. H. V. Waldon of Vita. A draft of the proposed constitution was considered in detail and prepared for presentation at the next annual meeting.

Conference on Industrial Medicine

THE American Association of Industrial Physicians and Surgeons, and the American Industrial Hygiene Association will hold their joint annual convention in Cincinnati from April 13th to 17th. The important medical and hygienic problems associated with the present huge task of American industry will be presented and discussed in clinics, lectures, symposia, and scientific exhibits. The central purpose of the meeting will be to provide a five-day institute for the interchange and dissemination of information on new problems as well as for the consideration of up-to-date methods of dealing with those that are well known. Most of the subjects chosen for discussion will be of interest not only to physicians but also to industrial engineers and executives.

Dr. H. M. Mosdell Honoured

AT an investiture ceremony at Government House, St. John's, Newfoundland, on November 25th, Dr. H. M. Mosdell received the insigna of the order of Commander of the British Empire (C.B.E.) in recognition of his loyal and devoted service to the country. Dr. Mosdell has been Secretary of the Department of Public Health and Welfare since the inception of Commission of Government.

Appointment

G. W. MILLER, M.D., D.P.H., has been appointed Principal Medical Officer of the Royal Navy in India as well of the Royal Indian Navy. Dr. Miller is a graduate of the University of Toronto and received the Diploma in Public Health at the School of Hygiene in 1936. He was formerly Deputy Public Health Commissioner with the Government of India.

CURRENT HEALTH LITERATURE

Intradermal Immunization

THE effectiveness of diphtheria antigens when given intradermally was studied in several groups of Schick-positive children. A single injection of 0.1 cc. of alum precipitated toxoid was given to 93 children. Of 48 who were Schick-tested six weeks later, 7 (or 15 per cent) were still positive. Two doses, 0.1 and 0.2 cc., three weeks apart were given to 38 children. Thirty-six were available for retest after eleven months and all were Schick-negative. Twenty children were given two doses of 0.2 and 0.2 cc. three weeks apart and when retested nine months later three were Schick-positive. After sixteen months only one still had a positive reaction.

A further group of 77 children received two doses of 0.1 and 0.2 cc. of plain unmodified toxoid three weeks apart. Nine months later only one child had a positive reaction.

The alum precipitated toxoid given intradermally produced a firm copper-coloured nodule at the site of each injection which persisted for five to six weeks. Sterile abscesses occurred in fifteen instances with this antigen. Only one sterile abscess followed the use of plain toxoid and local nodules and pain did not occur. The high degree of immunity obtained, together with less severe local reactions, suggests the possible use of 0.1 and 0.2 cc. of plain unmodified toxoid at an interval of three weeks, followed by a third injection if the Schick reaction is still positive, as a satisfactory procedure for diphtheria immunization.

Maurice L. Blatt and others, Am. J. Dis. Child., 1941, 62: 757.

Immunity and Positive Tuberculin Reaction

OBSERVATIONS are recorded here of the incidence of tuberculosis in a group of 1320 nurses in New York City hospitals who were tuberculin-positive at the beginning of their training and a comparable control group of 910 non-reactors. The duties and living conditions of the two groups were similar. Both groups were followed by X-ray examination every six months or oftener. Among the controls, originally non-reactors, 34 developed tuberculous lesions (28 parenchymal and 6 pleurisy with effusion), an incidence of 3.7 per cent. Six lesions were detected (5 parenchymal and 1 pleural effusion) among those originally tuberculin-positive, an incidence of less than 0.5 per cent. Thus the incidence of demonstrable lesions was approximately eight times as great among the originally tuberculin reactors as among the positive reactors.

Leopold Brahdy, Am. J. Pub. Health, 1941, 31: 1040.

Management of Scarlet Fever Contacts

THE authors review the existing isolation and quarantine regulations for scarlet fever in Illinois and their weaknesses and finally discuss a satisfactory routine for control of the disease.

Statistics from the Cook County Hospital and the city of Evanston showed that in 37 per cent the interval between the onset of disease in the contact and in the original patient exceeded seven days. In a number of instances new cases occurred in homes to which convalescents returned on being released according to quarantine regulations. In one series of 100 consecutive cases 63 were released free of complications but still carrying haemolytic streptococci. (It would not be possible to insist on negative cultures for release but at least such patients might be held until those who would be their intimate contacts have been immunized.)

The procedures recommended by the Dicks for dealing with scarlet fever in a home or an institution are enumerated: isolate the patient; do Dick tests on all contacts including adults; take blood agar plate cultures

of nose and throat swabs of all contacts; inspect the throat and upper part of trunk and take the temperature of all contacts. Where scarlet fever appears imminent from the above examinations, passive immunization is proceeded with immediately. Otherwise decision is deferred until the results of the Dick test and cultures become known on the following day. At that time passive or active immunization can be decided on and proper disposal of all contacts made. Application of this method in a series of 117 consecutive cases resulted in no contact cases.

Paul S. Rhoads and others, J.A.M.A., 1941, 117: 1063.

Studies in the Epidemiology of Primary and Secondary Syphilis in New York City

Two hundred and sixty-nine cases of infectious (primary and secondary) syphilis form the basis of this study, which extended over a period of four years. The majority of the patients were hospitalized for from one to two weeks during and following their period of infectiousness and this practice afforded a vital opportunity for securing the names of sources and contacts. Information from the cases was secured by the examining physician, a public health nurse, and the patients' visitors. Listed sources and contacts were brought in for complete physical examination, blood Wassermann and dark-field examination of all suspicious lesions. Individuals in whom no sign of syphilis was found were followed for three months from the time of exposure. Finally the contacts of infected contacts were traced where possible.

Six hundred and sixty-three contacts were named by the 269 cases and 541 or 81.7 per cent were found and examined. As a result, 224 new cases of infectious syphilis were found, a ratio of 83.3 new cases per 100 original cases. The approximate cost of the investigation was $18 per contact. A "probable source" was named by 170 of the original cases and 58.2 per cent were found and brought under treatment. Such a method of investigation should be followed by clinics or individuals undertaking treatment of cases.

Bruce Webster and E. I. Shelley, Am. J. Pub. Health, 1941, 31: 1199.

The Treatment of Bacillary (Flexner) Dysentery with Sulphanilyliguanidine

AN epidemic of Flexner dysentery extending over some six months in a mental hospital afforded an opportunity to test the therapeutic value of sulphanilyliguanidine as an intestinal antiseptic. Early attempts to control the epidemic by means of polyvalent Flexner vaccine were unsuccessful. Of 130 patients only 96 are considered in this report and these were either bacteriologically confirmed or had blood and mucus in their stools. Forty-one received drug therapy and 55 served as untreated controls. A further division was made in each group into "severe" and "mild" of which there were respectively 28 and 13 in the treated and 16 and 39 in the untreated group. Among these severe cases there were 2 deaths in the 28 treated patients and 3 deaths in the 16 untreated patients. Beneficial effects of the drug therapy were most evident in the severe cases and consisted of a change in the character and frequency of the stools, a rapid fall in temperature and the disappearance of toxic symptoms. The duration of blood and mucus in the stools was appreciably reduced in the severe treated group and convalescence was much shorter.

From bacteriological evidence obtained by examination of stools of convalescents it would appear that carriers are much less likely to occur in individuals treated with the drug during the acute phase of the disease than in those untreated or given the drug during convalescence. The importance of this finding if borne out is obvious.

David E. W. Anderson and Robert Cruickshank, Brit. M. J., 1941, Oct. 11, p. 499.

LABORATORY SUPPLEMENT

FOR THE PRESENTATION OF TECHNICAL PAPERS IN BACTERIOLOGY, PATHOLOGY, IMMUNOLOGY, CHEMISTRY, PARASITOLOGY, AND ALLIED FIELDS IN RELATION TO PUBLIC HEALTH

ABSTRACTS OF PAPERS

PRESENTED AT THE TENTH ANNUAL CHRISTMAS MEETING OF THE LABORATORY SECTION, CANADIAN PUBLIC HEALTH ASSOCIATION, TORONTO, DECEMBER 17 AND 18, 1941

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Organization of a Voluntary Blood Donors Clinic—Wm. D. Hay, Richardson Pathological Laboratory, Queen's University, Kingston.

A plan was shown to illustrate how a large lecture hall was divided up so as to give 5 cubicles and 11 small rooms separated by temporary partitions. A suitable table was placed in each cubicle. The table was fitted with arm rests and a bracket for holding the blood donation. It was found that donors who came late in the morning or those who had insufficient food owing to the diet restriction were prone to faint. These were given some nourishment without fats immediately before making the donation. This proved to be a valuable procedure.

The Analysis of Tetanus Toxoid-Antitoxin Floccules—P. J. Moloney and Joan N. Hennessy, Connaught Laboratories, University of Toronto.

Results are presented concerning the nitrogen content of tetanus toxoid and of tetanus antitoxin. These results were obtained by the application to tetanus toxoid-antitoxin floccules of the method of analysis used by Pappenheimer and Robinson on diphtheria toxin-antitoxin floccules.

The Occurrence of *Trichomonas Vaginalis* in Toronto—E. Kuitunen-Ekbaum, School of Hygiene, University of Toronto.

In co-operation with Dr. Edna Guest and Dr. E. W. Macdonald it was possible to examine vaginal swabs of 270 patients attending various clinics at the Women's College Hospital, Toronto. Of these, 97, or 36 per cent, showed *Trichomonas vaginalis*. During the time of the examination the patients were distributed in various clinics as follows:

Obstetrical	58	examined,	11	cases of	*T. vaginalis*	found	
Post-natal	28	"	6	"	"	"	"
Special	78	"	47	"	"	"	"
Gynaecological	101	"	31	"	"	"	"
Medical, surgical and wards	5	"	2	"	"	"	"

Vaginal, rectal, and mouth swabs were taken of 96 patients in order to find the inter-relation of the 3 species of *Trichomonas* in the same individual. *Trichomonas hominis* was found in 4 cases and *T. tenax* (buccalis) on one occasion. Two patients had both *T. vaginalis* and *T. hominis*, two had *T. hominis* only, and one had *T. tenax* only.

A Study of the Eosinophilia and Immunity Produced in Guinea Pigs by Infection with *Ascaris Lumbricoides L*—A. MURRAY FALLIS, Ontario Research Foundation, Toronto.

PRELIMINARY experiments relating to a study of *Ascaris* infection in guinea pigs showed that clinical symptoms were produced following the ingestion of several thousand infective eggs. The pigs began to lose weight about six days after being infected. If they survived they began to gain in weight about five days later. An eosinophilia was observed following the feeding of the eggs. It rose to a maximum in eight to ten days, then returned more slowly to normal. Guinea pigs examined during the course of the infection showed extensive lung lesions but no elevation in temperature was observed. Partial immunity appeared to be produced in guinea pigs by sub-lethal infections. This was apparent by a comparison of (1) the number of *Ascaris* larvae recovered from the lungs of non-immune and partially immune groups of pigs; (2) the rate of growth of the larvae in the two groups of pigs; (3) the extent of the lung lesions in the two groups. The latter were recorded on Kodachrome film. The course of the eosinophilia was followed by daily differential cell counts.

Reclamation of Agar—HILDA G. MACMORINE, Connaught Laboratories, University of Toronto.

A METHOD for the reclamation of agar from culture media has been devised.

Agar which has been used for the bulk growth of organisms in Roux bottles is melted by autoclaving and is then poured into glass cylinders about 6″ in diameter. If the medium is in petri dishes, the agar is either stripped with a spatula and thrown into a double boiler, or in the case of heavily-infected medium, the dish is placed into boiling water and the agar melted off. If blood or serum be present, this is coagulated by the heat and can be removed by filtration through cheesecloth and the bulk agar delivered into cylinders as before.

When the agar has set it is removed from the cylinder and cut into slices about 0.5 cm. thick. These are then placed into large vessels in which they are washed with cold tap water, first by decanting the water and broth which has been leached out, and then by pouring cold water through the agar slices held in a cheesecloth-lined funnel.

When the agar has been washed relatively free from broth, it is remelted and carbon black is added to decolourize and to remove other broth factors. The resulting mixture is filtered through a hot Buchner funnel lined with filter paper and hot paper pulp.

To the resulting agar solution, which is clear and colourless, are added potassium oxalate and potassium carbonate and the mixture is autoclaved for 1½ hours at 250° F. The hot agar is then filtered and poured into two volumes of cold acetone with vigorous stirring. Ethyl alcohol may be used but the resulting precipitate is more colloidal and more difficult to remove by filtration. With acetone the agar comes down as a fairly granular precipitate which may be filtered off in a Buchner funnel. The precipitated modified agar is washed with acetone and spread on paper to dry. The acetone dries out of the precipitate quite readily and the resulting agar is ready for use.

By this method 75 per cent of the agar used is recovered. It is as light in colour as ordinary commercial agar and when re-used in media gives a hardness only slightly inferior. The modified agar, moreover, is in no way bactericidal in action.

Spread of Tuberculous Infection by the Driver of a School Bus—WM. D. HAY, Richardson Pathological Laboratory, Queen's University, Kingston.

IN a secondary school 132 pupils were given the tuberculin test. Of these, 24 reacted positively to 1/20 mgm. tuberculin. The school bus regularly brought 16 pupils to the school. Fifteen of these reacted positively, and one of the 15 was found to be an early case of tuberculosis by X-ray examination. The driver of the bus was discovered to be an open case of tuberculosis with positive sputum. Further study showed that in the case of the 15 positives other members of the respective families who were not in contact with the driver were non-reactors in 13 instances.

A Case of Obscure Pulmonary Infection: Observations on Lung Infection Roentgenologically Tuberculous but Bacteriologically Yielding a Pathogenic Yeast and Non-pathogenic Acid-fast Bacillus—M. VIOLA RAE, Mountain Sanatorium, Hamilton, Ontario.

THIS report illustrates the confusion which may arise from the presence of acid-fast saprophytes in sputum and gastric washings in a case which roentgenologically suggests pulmonary tuberculosis but was without symptoms. Skin tests were negative to human tuberculin 1:400 and positive to avian tuberculin 1:400. Culture repeatedly yielded a chromogenic acid-fast bacillus which was non-pathogenic to guinea pigs and hens. *Monilia albicans* was also cultured from the sputum and was pathogenic to rabbits, rats and guinea pigs. The final impression was of pulmonary moniliasis with the acid-fast bacilli a non-pathogenic contaminant.

A Preliminary Report on the Effect of the Toxin of *Cl. welchii* (Type A) in the Lung of the Ox—FRANK W. SCHOFIELD, Ontario Veterinary College, Guelph.

BACTERIA-FREE filtrates of broth cultures of *Cl. welchii* (type A), when injected into the peritoneal cavity of the cow over a period of several days, cause changes in the lung tissue accompanied by increasing difficulty in

respiration. Symptoms of acute toxaemia are present. There may be a transient elevation in temperature. At post-mortem the lung is congested and odematous, and the interstitial tissue filled with air. The conditions both clinical and pathological closely resemble those seen in naturally occurring cases in cattle. We believe therefore that we have demonstrated the relationship between the toxin of *Cl. welchii* and acute pulmonary emphysema of cattle, that the disease is essentially an entero-toxaemia.

A Sporadic Case of Food Infection due to *Salmonella stanley*—J. WYLLIE, Department of Preventive Medicine, Queen's University.

THE recorded cases of food infection due to *Salmonella stanley* are not numerous. In May 1941 an organism was isolated from the blood of a patient whose illness was considered by the family physician to be suggestive of a mild enteric infection. This organism possesses the morphological, cultural and biochemical characters of the paratyphoid-food infection group and contains the same H antigen as *Bact. typhosum* in the specific phase and the somatic antigens IV and V, in the Kauffmann-White Schema. Neither the source nor the vehicle of infection was established.

The Present Status of Phage Typing of *Bact. typhosum* — JAMES CRAIGIE, Connaught Laboratories and School of Hygiene, University of Toronto.

IN developing the methods of typing strains of *Bact. typhosum* by means of type II ϕ, it became necessary to recognize certain subtypes of types B, D, E and F and to provide phage preparations for their identification. While the epidemiological significance of such subtype differences was in doubt, it has hitherto been necessary to depend solely on epidemiological observations to determine whether differences between subtypes were of practical value. More recently, various laboratory observations seem to have paved the way for a revised and simplified typing schema. The more important of these observations are as follows:

1. Degradation of the V form may occur within the limits of the V or Vi form as it is generally defined. Subcultures of a strain may be a mixture of the original V form and degraded V forms derived therefrom.

2. Strains, and the degraded V forms of any particular strain differ in the duration of their V phase in an actively multiplying culture at 37.5° C. This applies to the V phase whether defined as (a) the period during which the organisms are resistant to agglutination by O serum or (b) the period of sensitivity to lysis by Vi phage; but there is not necessarily an absolute correlation between (a) and (b) when strains of different types are compared. When a certain critical population in a pure V form culture is reached, development of Vi antigen and sensitivity to Vi ϕ ceases or becomes negligible and the culture continues to grow in the W phase of the V form.

3. When ϕ II is transferred from one to another of certain clear-cut types

(now designated α types), affinity for the preceding α type is lost. On the other hand, when φ II has been grown on certain subtypes (now included in the β or γ types) the phage retains an affinity for that subtype and this persists indefinitely when it is transferred to α or other β types.

4. With improvements in method, an increasing number of "imperfect V form" strains, resistant to φ II and therefore untypable, are being found to contain symbiotic phage. Such forms can be produced from the α types by introducing such symbiotic phage.

5. It now appears probable that as a result of the phenomena referred to in 3 and 4 above, the early preparations of φ II had acquired an affinity for certain β and γ forms. Consequently the phage attacked and could be propagated on certain β and γ forms and it became necessary to recognize subtypes B_2, B_3, B_4, D_1 and D_3. However it has been found possible recently to eliminate affinity for these subtypes from φ II by special manipulations on a series of α types. Following this a new series of φ II preparations of increased specificity and limited in attack to the α types have been made and are now available.

The elimination of subtypes from the phage typing schema has simplified this schema and reduced the amount of laboratory work involved in typing. The schema, however, necessarily remains incomplete, pending the investigation of strains which cannot be typed with the new series of α phages now available. Such strains include:

(a) Partially degraded α forms. As these become identified it will be possible to provide new α phage preparations which have an equal affinity for the undegraded and degraded α forms of a given type, e.g. the new φ F which does not differentiate subtypes F_1 and F_2.

(b) β forms, of modified phage sensitivity and undetermined status.

(c) γ forms, resistant to φ II, many of which carry symbiotic phage, the presence of which confers resistance to φ II.

V FORMS OF BACT. TYPHOSUM

α Forms	β Forms	γ Forms
Lysed by homologous mutant of φ II. Multiplication of φ II on these types produces no permanent alterations in affinities of the φ.	Strains of undetermined status. Former subtypes B_2, B_3, B_4, D_3.	"Imperfect V Forms". Resistant to φ II.
	Also D_1	Many have been shown → to carry symbiotic φ.
Type A*	Multiplication of φ II on a β type results in acquisition of a permanent affinity for that β type, which is NOT LOST when the φ is subsequently propagated on other α or β types.	
. . . . .		
Type C		
. . . . .		
Type E		
Type F		
Type G		
Type H		
Type J		
Type L		

*Includes former subtype B_1.

The Incidence of Types of *B. typhosus* in Ontario—VERA CROSSLEY. Central Laboratory, Department of Health of Ontario.

SINCE the first of July 1939, the typing of strains of *B. typhosus* has been carried out as a routine procedure in the Laboratories of the Ontario Department of Health at Toronto. All strains isolated from blood culture, stool, and urine of cases and carriers have been subjected to the test initiated by Dr. James Craigie and Dr. C. H. Yen in 1938, and modified by Dr. Craigie in 1940 and 1941. A total of 355 strains have been tested by this method, from which it was noted that types E, F, C and A were the most frequent isolated strains, and in that order.

The routine typing of all strains of *B. typhosus* isolated has been of service to our Epidemiological Division by providing a record of the types of *B. typhosus* to be found in both cases and carriers throughout the Province.

The phage preparations for carrying out the tests were obtained from Dr. James Craigie of the School of Hygiene, in the University of Toronto, as were also the standard strains used to determine the critical test dilution.

Typing of *B. typhosus* with Bacteriophage in the Province of Quebec—J. M. DESRANLEAU, Division of Laboratories, Ministry of Health and Social Welfare of Quebec, Montreal.

DURING a period of about ten weeks, 351 strains of *B. typhosus* isolated from 200 persons in the Province of Quebec were examined for the purpose of determining their types by means of preparations of bacteriophage. The methods of isolation and preservation permitted the recovery of V forms of the organisms from 98 per cent of these strains. A simplified technique outlined by Dr. James Craigie was employed and found to be easy of application.

Forty per cent of the strains were successfully typed by this method. Only types A, C, E and F were encountered. Fifty-eight per cent of the strains proved refractory to the lytic action of the main types of type II bacteriophage preparations. This large proportion of refractory strains was due particularly to inclusion in the series of a large number of β and γ forms of *B. typhosus* that were responsible for the occurrence of three typhoid outbreaks. Further study of these strains is in progress.

The Epidemiological Aspects of *B. typhosus* Typing—A. R. FOLEY, Epidemiologist, Ministry of Health and Social Welfare, Quebec.

THE 214 cases of this study are distributed over five months. On 133 cases of typhoid fever one typing was made and in 81 cases there were 266 cultures submitted.

Two types, "C" and "E", were more prevalent than the others, but a large proportion of cases could not be typed.

In cases where multiple typing was made, the secondary types were always true to the original type, except in five instances when it became impossible to type them.

Considerations are given on the typing done in five outbreaks.

Schick Tests in Medical Students—FRED CADHAM, Director of Bacteriological Laboratory, Department of Health and Public Welfare, Manitoba.

DURING the past fourteen years 738 students of the Medical School of the University of Manitoba received a Schick test. From 1928 to 1939 the majority of those tested were second-year students. During the past four years the test has been carried out on the first-year students.

The average age of the students was 20.7 years. Forty-six students came from the farm, 139 from towns of 1,000 to 10,000 population and 557 students from cities of over 10,000. Table 1 shows the result of the Schick tests.

TABLE I

Year	Number of students	Positive	Negative
1928	47	7	40
1929	47	9	38
1930	47	10	37
1931	63	15	48
1932	46	17	29
1933	51	19	32
1934	47	18	29
1935	40	18	22
1936	45	20	25
1937	44	22	22
1938	138	68	70
1939	56	27	29
1940	59	37	22
1941	59	29	30
Total	789	316	473

A comparison of the average number of positive reactions in the students from the farm, towns, and cities respectively showed that those from the towns and cities were approximately 42 per cent and from the farm 43 per cent —an insignificant difference. In these days of consolidated country schools and rapid transportation the isolation factor long associated with rural areas is more apparent than real.

These findings indicate that in this age group there is a gradual increase in the number of non-immunes to diphtheria.

In 1938 Pulley and Fleisher reported the results obtained in Schick reactions over a period of seven years, 1930-1936, in medical students of the sophomore year of the St. Louis University School of Medicine. During the period they reported a gradual diminution of Schick negatives.

Recently Cameron in a survey of adults reported that approximately 50 per cent of the individuals investigated had a low diphtheria antitoxin titre in their blood.

The survey of the medical students in Manitoba indicates that today in the age group concerned approximately 50 per cent are not immune to diphtheria. At the present time it is of particular concern that the individuals in this age group should be, and should remain, physically fit.

Individual Variation in Immunity: Variance of Antitoxic Response in Guinea Pigs Inoculated with Diphtheria Toxoid—DOROTHY J. STEWART and F. G. JONES, The Lilly Research Laboratories, Eli Lilly and Company, Indianapolis.

EVIDENCE is presented to stress the importance of individual variation in response to diphtheria toxoid. This factor might account for some of the conflicting reports in the literature.

Following injection of fluid toxoid, serums from twenty-two guinea pigs of the same sex, breed, weight and environment were tested for diphtheria antitoxin titres. Titrations were made by intracutaneous tests on rabbits using a modification of Fraser's method. Charts and tables are included, showing great variance in response of many individual animals, although about 50 per cent of the group produced average titres.

Psittacosis Infection: Laboratory Diagnosis—A. L. MACNABB and S. F. PENNY, Central Laboratory, Department of Health of Ontario.

PSITTACOSIS infection has been identified in Ontario. The virus of psittacosis has been isolated from sputum samples from ten patients, and from splenic and hepatic tissue of one case, taken at autopsy. Positive complement-fixation test results were obtained, when the blood sera of 20 patients were tested against the antigens used by Meyer. In 27 instances, where both a blood and sputum specimen were submitted, the complement-fixation test result was positive in 12, and the sputum was found to contain virus in 10 instances.

Little reliance should be placed on one sputum examination in the laboratory diagnosis of psittacosis in humans. Repeated sputum specimens should be submitted. After the illness is of twelve days' duration or more, a peripheral blood sample should also be submitted.

Of 184 bird samples from 12 aviaries, submitted for laboratory examination, 88 contained the virus of psittacosis. Eight hundred and forty-two birds were destroyed. The white mouse is the experimental animal of choice. Laboratory workers and those in attendance should exercise every precaution in handling infective material.

Control measures were instituted by the passage of regulations whereby every owner of psittacine birds must report them to the medical officer of health. The regulations further require that all sales and transfers of aviary stock be reported. An accurate record is maintained for each aviary.

I wish to acknowledge the kindly assistance of Dr. K. F. Meyer, George Williams Hooper Foundation, San Francisco, and Dr. James Craigie, School of Hygiene, University of Toronto, for helpful suggestions relative to the staining procedure.

Psittacosis Infection: Epidemiology—W. N. TURPEL, Epidemiologist, Department of Health of Ontario.

OUTBREAKS have usually been associated with a history of exposure to infected birds. Epidemiological investigations have revealed various types

of psittacine birds as the source of the outbreaks. Parrots, parakeets, love birds, budgerigars, finches, canaries and conures have all been incriminated. Meyer, of California, has also reported the disease in barnyard fowl—chickens and pigeons.

Ill or dying birds are the usual sources of infection, and young birds have been proved to be more susceptible to the infection than old ones. It has been established that there also are carriers among psittacine birds. They exhibit no warning or suspicious signs of their dangerous condition.

Human cases of psittacosis can occur by any one, or a combination of the following means:

(1) Direct contact, handling or fondling an infected bird.

(2) Direct contact, from a human case.

(3) Indirect contact, by an air-borne infection in rooms of aviaries, the dried excreta of ill or carrier birds being the usual source. Nasal secretions of birds ill with psittacosis can also be a source of infection.

Epidemiological investigations have revealed that the disease occurs with greatest frequency in owners or employees in large or small parakeet aviaries. Individuals engaged in breeding, and lovers or owners of psittacine pets coming closely in contact with infected birds, are those most exposed to the disease. Nurses, physicians and laboratory workers risk occupational exposure to psittacosis.

The occurrence of multiple cases in the same household has been an interesting and fairly constant finding.

In the past, there has been a definite seasonal incidence during the winter months. In winter it is possible that more prolonged exposure in closed rooms occurs, and also cold weather may play some part in lowering the resistance of both birds and humans. That psittacosis can be contracted at any time of the year, depending entirely upon the time of exposure to a source of infection, should be remembered.

Children and the young adult groups are rarely attacked, and there is no satisfactory explanation of this fact. Most cases occur in those over forty years of age.

A greater frequency of psittacosis in women has been found. A ratio of 2 to 1 is common. The logical explanation of this would seem to be that women come more closely into contact with birds, in that they handle and fondle their pets, and also have the care of the birds in their homes.

The case fatality rate has varied from 15 per cent to 45 per cent, and it can be safely said that an average rate of 20 per cent would hold. No deaths below the age of thirty have occurred.

The prevention of this disease would naturally be pointed towards the elimination of all sources of infection. To this end, therefore, legislation must be promulgated to control the importing and traffic of psittacine birds. It is also necessary to have rules and regulations in order to deal with the detection and destruction of sources of infection.

A well-directed campaign to educate the public, and in particular the owners of psittacine birds, as to the dangers of infection from these birds, is of prime importance in the prevention and control of psittacosis.

An Epidemiological Investigation of a Family Outbreak of Poliomyelitis—J. WYLLIE, Department of Preventive Medicine, Queen's University.

As a general rule, paralytic poliomyelitis shows little tendency to spread in a household; single cases occur in the great majority of families attacked.

The association of two successive cases of facial palsy, regarded as Bell's palsy, with a case of paralytic poliomyelitis, in three members of a rural family prompted an investigation of the attendant circumstances. The following table shows the dates of onset, the type of illness and the interval between the dates of onset among the affected members of the family.

Name	Age	Date of Onset (1940)	Nature of illness	Interval in days between dates of onset
Gordena...	20	Aug. 15*	R. facial palsy.	..
Gwen.....	15	Sept. 1	R. facial palsy.	16
Mrs. T—	48	Oct. 1	Influenzal symptoms 2-3 days in bed.	30
Connell...	10	Oct. 3	Influenzal symptoms for a day.	32
Murray...	7	Oct. 7	Polio.—Left leg paralysed.	6 or 36**
Marie.....	17	Oct. 7	Sore throat—1 week.	6

*Date of return from Sudbury to her home at Althorpe, three days after her illness began.
**Six days if patient's mother is considered to be the source of infection; 36 days if patient's sister (Gwen) is considered to be the source of infection.

The condition of the two girls, Gordena and Gwen, and of their brother Murray, a year after the attack, indicates clearly residual paralyses, more pronounced in Murray's case. It is suggested that the virus of poliomyelitis may have involved the nucleus of the VII N, just as it is known to affect the anterior horn cells of the spinal cord. This view is supported by (a) the incubation period, (b) the onset of Gwen's illness with headache, sore throat and pain in the spine on bending the head forward, (c) the unlikely coincidence of two cases of peripheral facial paralysis followed by a case of paralytic poliomyelitis in members of the same family; (d) the season of occurrence of the cases does not favour the theory of "refrigeration" of the "superficial" part of the facial nerve.

Lymphocytic Choriomeningitis—CHAS. A. MITCHELL and MAX KLOTZ, Animal Diseases Research Institute, Hull, and Ottawa Civic Hospital.

FROM published accounts infection with the virus of lymphocytic choriomeningitis would appear to be fairly wide-spread. Infections, however, are rarely fatal. This paper deals with an infection which occurred in a twelve-year-old child who later died. The infection involved the central nervous system and the lymphocytic choriomeningitis virus was demonstrated.

Agglutination of Red Cells by Influenza Virus—LAURELLA MCCLELLAND, Connaught Laboratories, University of Toronto.

IN harvesting eggs infected with influenza A or B, spontaneous agglutination of red blood cells occurs when these cells escape from ruptured blood vessels into the allantoic fluid which contains the virus in high titre. This phenomenon appears to be peculiar to eggs infected with influenza viruses A and B. Titrations have shown that virus is adsorbed from infected fluid by the red blood cells and that it adheres to the stroma even after disruption.

Agglutination of red blood cells in the presence of free virus has been employed in an in vitro test for the titration of neutralizing antibodies in sera. In this, infected allantoic fluid is mixed with dilutions of sera under test followed by the addition of red cells of chickens. In the higher serum dilutions there is agglutination whereas in the lower dilution, this is inhibited. The end points obtained by this method compare well with the titres obtained in neutralization tests in the mouse. Such a test may be especially useful in the investigation of large numbers of sera.

Immunity in Influenza and the Results of Vaccination—RONALD HARE, WILFRID J. AUGER and LAURELLA MCCLELLAND, Connaught Laboratories, University of Toronto.

THE immunity levels of cases of influenza A and of a group of immunized and control normal individuals have been determined using the titre of sera in neutralization tests in the mouse. Estimations were made of the antibody levels in three groups—individuals at the commencement of an epidemic, cases during the early stages and in the convalescent period, and persons before and after immunization with the complex vaccine of Horsfall and Lennette.

If it be accepted that neutralizing antibody level and succeptibility to clinical infection are directly related, these investigations indicate from the low titre obtained that a high proportion of the general population is susceptible to influenza A. Also that the administration of one dose of the complex vaccine is only successful in raising the antibodies to a safe level for that particular strain of influenza in about fifty per cent of susceptibles. But an even more important drawback to mass immunization against influenza is that even in an epidemic, a number of agents are responsible, many of which are as yet unidentified. Identification of these agents and the manufacture of an efficient antigen from them are necessary before a completely efficient immunizing agent can be made.

Report of the Committee on Bacteriological Examination of Water and Sewage

Laboratory Section, Canadian Public Health Association

N. J. HOWARD, A. G. LOCHHEAD
AND M. H. McCRADY, *Chairman*

IN the Committee's report for the year 1940, it was stated that special attention was to be given, during the ensuing year, to the following subjects relating to water and sewage bacteriological methods:

1. The possibility of the use of the new tryptone-glucose-extract agar, now employed as a standard medium for milk analysis, for water and sewage work.

2. The possibility of securing further information regarding the cause of false lactose broth presumptives obtained in the course of examination of Canadian waters.

Tryptone-Glucose-Extract Agar

During the past year the first of these subjects was studied by the Division of Laboratories of the Quebec Ministry of Health.

The usual bacterial counts of 102 samples of water from springs, wells, lakes, rivers and purification plants, were determined by subjecting each sample to the following plating procedures:

4 plates plain agar
4 " tryptone-glucose-extract agar
4 " tryptone-glucose-extract agar with 1.0 per cent skim milk.

Dilutions were employed when considered advisable; two plates of each group were incubated at 37° C. for twenty-four hours and two plates at 20° C. for forty-eight hours. Counting was done by means of the Quebec Colony Counter.

The results of these comparative tests showed that only minor differences in counts were obtained by using these different agars; but the colonies appearing in the tryptone-glucose-extract agar were often larger and hence more easily counted than were those in the plain agar. The use of tryptone-glucose-extract agar with added milk, however, frequently resulted in such rapid growth of spreaders that many plates were lost.

It may be concluded from this study, therefore, that tryptone-glucose-extract agar (without added milk) can advantageously be substituted for Standard Methods plain agar in the bacteriological examination of Quebec waters.

False Lactose Broth Presumptives

Considerable work has also been done during the year on the second subject, that of the cause of false lactose broth presumptives which are so

frequently encountered in the standard method of estimating the coliform density of water. The Division of Bacteriology and Dairy Research, Dominion Department of Agriculture, Ottawa, has undertaken a study of this question, in the course of which a number of samples from the Montreal municipal finished water supply was examined. This water was chosen because gas formation caused by organisms other than those of the coliform group occurs very frequently when portions of this water are planted in standard lactose broth.

Some very interesting results have already been secured from this investigation, but since the work is still in progress and since a similar study of other waters is contemplated, a final report on this work will be presented at a later date.

PROGRAM FOR 1942

The Committee's plans for the coming year include:

1. A continuation of the study of the cause of false lactose broth presumptives.

2. A more or less extensive study of certain new media that have been proposed for estimation of the number of coliform organisms in water.

The contemplated revision of "Standard Methods of Examination of Water and Sewage" will probably not be completed before 1943; consequently ample time remains for study by this committee of any particularly controversial points that may arise in the course of the revision.

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